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8^{vo} 156.

A N
E S S A Y
TOWARDS A
NATURAL HISTORY
OF THE
COUNTY of *DUBLIN*,

Accommodated to the
Noble DESIGNS of the
DUBLIN SOCIETY;

Affording a summary View

I. Of its Vegetables, with their mechanical and
œconomical Uses, and as Food for Men
and Cattle; a Catalogue of our Vegetable
Poisons; and a Botanical Kalendar, exhibit-
ing the respective Months in which most
of the Simples in Use are found in Flower.

II. Of its Animals.

III. Of its Soil, and the State of its Agri-
culture; its Fossils, Mines, Minerals, and
some lately-discovered mineral Waters; par-
ticularly the sulphureous Water at *Lucan*, and
its medicinal Virtues, from practical Obser-
vations.

IV. Of the Nature of the Climate, from Dia-
ries of the Weather, kept in *Dublin* for fifty
Years past; interspersed with meteorological
and œconomical Observations.

By *JOHN RUTTY*, M.D.

V O L. II.

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ERRATUM.

From P. 188 to P. 192, instead of *Purging Waters*, in the running Title, read *Lucan Water*.

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OF THE
SOIL of the COUNTY,
AND THE
State of its AGRICULTURE,
WITH A
Brief Account of its MINERALS.

THE Soil of the County in general is poor. The richest spot in it, by repute, is at *Dromanagh*, near *Kinure*, by the Sea-side, on the estate of Sir *Robert Echlin*; it is said that 23 acres of it will fatten a greater number of cattle in half a year than I dare to mention, and Sheep afterwards. The Soil is like garden-mould, and from 9 to 12 inches deep. Spirit of Vitriol poured on it caused no ebullition.

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It

It is said to purge Cattle newly put into it, which is imputed to the Spray of the Sea which is near it. The herbage is purple and white Clover, plenty of Thistles and Nettles, Ray-grafs, Bents, or *Gramen cristatum*, & *Gramen vernum spica laxa*.

From my own inspection made in nineteen perambulations, the prevailing Soil of the County appears to be chiefly Gravel and Loam, frequently Clay, sometimes stoney and flatey, sometimes sandy, more rarely rich mould, very rarely marshy or boggy. Wherefore the air in general, abstractly from foreign admixtures, should be serene and wholesome.

It was however so far frequently clayey, that in our 11th and 12th journies to the *North*, *Malahide*, *Swords*, *Corballis the lower*, *Donnabate*, *Curtlagh*, *Balruddery*, *Gormanstown*, the *Naul*, and *Holywood*, the predominant Soil was Clay, and made no ebullition with Spirit of Vitriol, and particularly from *Curtlagh* to *Balruddery*, which gives an obvious reason for Sea Sand proving a better manure there than Marl.

Also the prevailing Soil in our journey to *Abbotstown*, *Curduff*, the other *Cloghran*, the *Bay*, *Sprinklestown*, *Ward*, *Kilsoghan*, *Killofery*, *Stradbally*, *Fieldstown*, *Knocksedan* and *Huntstown*, was Clay and under Corn, tho' here and there were spots of Limestone and calcarious Sand or sandy Marl, of which last hereafter.

On

On the sides of the mountains, along the whole tract of land from *Rathcool* to *Carrickmayne*, are frequent and profitable Dairies interspersed, yielding hay of a sweeter smell, and intermixed with the white Trefoyl; and the Grass, tho' far poorer and less rank than that of the Meadows, produces much richer Milk and more Butter than the rank Grass of the meadows; and accordingly *Dublin* is chiefly supplied with Milk from the rank grass of the dunged meadows, but with the best Butter from the poorer, but sweeter lands, along the sides of the mountains.

AGRICULTURE.

SOME traces of the Plough have indeed been discovered on the tops of the Mountains, but these seem to have been of antient date.

Of late years, however, our Lands, even the mountainous tracts, and others which were formerly over-run with Furze, are generally improved, to which our Cultivation of Potatoes has not a little contributed, being greatly beneficial to the land, and meliorating the Soil, and by this means the sides of the mountains

South of *Dublin*, and the mountainous ground of *Glancullen*, and the mountains near *Carrickmayne* yield Rye, Oats or Barley, having been previously planted with Potatoes, which prepare the Soil for the Corn. Moreover, the Lands near the Metropolis have been and may be still more improved, by a proper application of divers articles supplied in great plenty by the city, and which are great nuisances, and the removal of which would contribute to the health of the inhabitants. It shall suffice to give a few instances.

Of *Street-Dirt*, (which is to be exposed to rot and frequently stirred) I shall only give the testimony of *Miller*, in his *Gardener's Dictionary*, viz. "There is not any sort of Manure equal to the cleansing of *London* streets, for all stubborn clayey soils, which will be better separated, and in a much less time with this manure than any compost whatever; and it is extremely well worth procuring for corn, grass, or garden land."

Next, the ashes of Pit-coal are an excellent Manure in moist and clayey grounds, killing moss and rushes, promoting the growth of Trefoil; and preventing Mildew, if mixed with Wheat before it is sown, or sown upon it.

Soot of the same Coal well deserves attention as an excellent Manure for arable and pasture lands, suiting best with Clays, and those called
wet

wet and four lands, makes the grafs sweet, destroys Mofs and Weeds, is a great enemy to worms, and prevents the Fly from eating the Turneps.

To these may be added,

Plaster and *Rubbish* of old houses, consisting of Lime and Clay, which hath received the impressions of the air and the exhalations of the earth, for a long series of years. And lastly,

Human Dung, which is a manure of great antiquity, as appears from the following passage in *Columella*, lib. ii. cap. xv. cited in *Bodæns a Stapel's* notes on *Theophrastus's Historia Plantarum*.

“*Tria sunt Stercoris genera præcipua, quod ex avibus, quod ex hominibus, quod ex pecudibus fit. Avium primum habetur quod ex Columbariis egeritur, quod modice terram fermeptare comperimus. Secundum deinde quod homines faciunt per se naturæ ferventioris, & idcirco terram perurit.*”

But the Annotator subjoins these words:

“*Miror Columellam stercus humanum columbino acrius scribere, cum constet columbinum calceos exurere, quod humanum non præstat, humidius enim est, unde acrimonia magis diluta.*

In

In *China* (A) where husbandmen are very numerous, and as to rank, preferred to Merchants and Mechanics, this article is sold for the purpose of a Manure, and the Countrymen go about the streets, crying, "Who will exchange this for Oil, Wood or Herbs, all which they carry with them."

I deem this well worthy of mention here, as the removing this nuisance from our streets, would contribute to render the city more clean and wholesome.

It is much used in *Italy* and the South of *France*, for their vines, orange and citron trees, and it is professedly and avowedly laid on the Corn lands in *Flanders*, and is clandestinely used in some parts of *England*.

For this purpose it is kept in pits for one, two, three or four years, that of four years being counted the best; and they prefer that brought from places where most flesh is eaten, as the richest Manure of all others, and consequently ours should lay claim to a peculiar esteem.

But it is to be noted that if either Dung or Urine were to be applied immediately to the roots of plants, it would burn and kill them,

fo

(A) *Churchil's Collection of Voyages.*

so that they are not to be used until they have lost their fetid quality, and are softened by age, and moreover are to be tempered with earth, or mixed with straw or leaves, and should be turned up from time to time, that they may rot, and their heat be moderated : for the right use of Dung is when it is perfectly rotted and reduced to earth, which it is by this means, and indeed to an earth more open and light in its parts than the lightest common earth, and as such it is good for stiff soils, but entirely ruins light lands (a).

But there are some other Manures which demand a more particular account, viz.

(a) Bradley.

of

Of M A R L.

M A R L, tho' long known in some parts of *Ireland*, is but of late introduction into *Fingall*, and which is owing (as I am informed) to *Alexander Hamilton*, Esq; from the North.

The Word Marl was formerly used in a very vague sense, and of consequence it must sometimes happen that what was affirmed of one species of it did not hold in another:

I shall therefore here adopt the Definition of Marl given us by the two best late Writers on Fossils, viz. *Hill* and *Emanuel Mendez de Costa*, viz.

“ Earths but slightly coherent, not ductile, stiff or viscid while moist, most easily diffusible in and disunited by water, and by it reduced to a soft, loose, incoherent Mass.”

Walerius indeed and some others add as a characteristic of Marl, that it makes an effervescence with Acids, but both the above named Authors agree in ranking many Earths under the denomination of Marls, which make no effervescence with Aqua-fortis, v g. the *Marga columbina Plinii*, being a stoney bluish Marl of *Hill*, so long celebrated as a Manure, makes no ebullition with Acids, as neither do several of the red Marls of the

the same Authors, nor several green and black Marls mentioned by *Hill*, nor two of the blue fort mentioned by *De Costa*, and yet several of these are found to make excellent Manures, for clayey stiff Soils, and the leaner ploughed lands.

Indeed I have not yet met with any Marls in this Neighbourhood, which do not make an ebullition with Acids: for, tho' the County of *Dublin* affords great plenty, and a considerable variety of this useful Manure, as the white and chalky, which whiten the hands, and acquire the taste of Lime by calcination, the grey, the blue, the yellowish, the reddish, the brown and the black, and some shelly, some stoney and slatey, yet all these effervesce with Acids, and no wonder, since our Soil abounds with Limestone and calcarious earth, and the differently coloured Marls above-mentioned, for the most part are no more than the calcarious earth combined with a little mineral Oil, Clay, and sometimes a little Ochre or Iron.

Markham condemns the use of Marl in general on a stiff, wet, cold Clay: Nevertheless by its swelling and bursting in water, it shews a fitness to loosen a Soil too stiff and adhesive; and so it has by experience been found to mend a clayey Soil; yet on the other hand it has been observed to stiffen a too light and sandy Soil, and the sandy Loam; for as it has a certain degree of cohesion, it brings ground that has less than itself

to a due degree of consistence ; and I have seen the good effects of the blue Marl on a sharp, gravelly, mountainous Soil.

Thus far the operation of Marl may be illustrated upon mechanical principles ; but moreover it is said to be also useful in all sorts of Soils, commonly meliorating the Earth, making barren lands fruitful, and increasing the Crops of Corn, fourfold, and causing it to produce Trefoyl instead of Quichgrafs or Dyer's weed, and Wheat instead of Rye, which is attributed by some to the Magnetism with respect to the Acid of the Air, thereby generating the calcarious Nitre which is reckoned to have a great share in promoting vegetation ; and moreover, if any Soil be vitiated by a mixture of a vitriolic earth, or of that vitriolic acid, which more or less is found in most of our Bogs, the calcarious particles of Marl will be fit to sweeten such a literally sour Soil.

It will however be worth while to consider the several species of Marl as a further means of illustrating and distinguishing its operations.

Some have made three divisions of it, *viz.*
 1. The Shelly. 2. The Stiff or Clayey. 3. The Slaty ; to which I must beg leave to add a fourth, *viz.* the Sandy Marl, being frequent in this County, and therefore I shall subjoin a particular account of it.

1. The shelly Marl improves clayey grounds, which the stiff sort does not. It is also sooner saturated

faturated by the Acid of the Air, and forms the neutral Salt above-mentioned sooner, and it produces as good a crop the first year after it has been laid on as it does in any of the subsequent.

2. The clayey or stiffer Marl improves a sandy Soil, and agrees to Clay in producing fertility slowly, not having its effect generally till the third year, tho' quicker than Clay, but less lasting.

3. Slate Marl, which is still more slow in its operation than the Clayey sort, spending more slowly, but lasts longer, and loosens the stiffest Clay.

To this Class may be referred that which is called *rotten Limestone*, being proper for Manure, and not for building, and is a Marl, according to *Hill*, falling off in Scales gradually year after year.

Akin to these seems to be the *Rock-Marl*, of which see an account hereafter among the Mineral Petrifications.

4. Sandy Marl. This is either peculiar to us, or at least far more frequent than in *England*. It is here commonly called Limestone-Sand, but more properly *Sandy-Marl*, having commonly some small degree of tenacity, and agrees to the *Marga arenacea* of *Cæsalpinus de Metallicis*, and to the *Marga arenosa lutea friabilis* of *De Costa*, with this difference, that I have found none in this County but what effervesces with Acids; and ours

varies in its colour, having from slight extraneous mixture been found sometimes brownish, blue and black.

There are frequent pits and quarries of this Sand or rather Marl, and often accompanied with what is called *Limestone-Gravel* in this County, v. g. near *Rathfarnham* bridge, near *Tallow*, at *Green-hills*, at *Monkstowne*, at *Kilmashoge*, at *Huntstowne*, near *Rogers' town*, at *Glasamucky*, *Coliagh's town* and *Bornabriny*.

In all experiments it proves an excellent Manure in clayey Soils, mellowing the stiff Clay, advancing the rent of the lands by producing Clover where Quichgrafs grew before, and yielding good crops of Bere, Barley and Wheat.

I made an Analysis of it by an easy process, thus: Water poured on it and shook up, exhibited three different Substances. 1. Of Sand properly so called, as a kind of Gem, being untouched by Acids. 2. Of an unctuous substance. 3. Of a calcarious Sand which effervesces with and is dissolved by *Aqua-fortis*, tho' of this in one specimen there was not quite one third of the whole.

A singular species of this Marl may perhaps merit a particular account, viz. at *St. Marnock's* old Church near *Carrick-hill*, is a black Sand, consisting of a fine black Mould incorporated with
Sand,

Sand, which has proved an excellent Manure in the neighbouring clayey Soil, increasing greatly the crops of Wheat; and used with great success by *B. Hoffsteger* in his Flower garden at *Feltrim*.

It sparkled a little on the red hot iron, and excited a considerable ebullition with Aqua fortis. The Sand separated from the earth effervesced considerably with Aqua-fortis, so that the Sand contains some calcarious matter, but the Earth separated from the Sand is quiet with Aqua fortis, but it sparkles and smells strong on the red hot iron, so that here is an unctuous or oily matter, and besides Sand as a Gem, also some sparry, calcarious or shelly matter.

Thus it abundantly appears that this Fossil is not to be considered only mechanically as a Manure, *viz.* as a sharp matter proper to correct and divide a tough Clay, but as such a sharp matter combined with an *unctuous substance* and a *calcarious earth*. (B)

Lac Lune is another Fossil, of which I shall here annex some account, as being by some of our best Writers reduced to the Class of Marls, and tho' it stands dignified by the whimsical title of

(c) In the *Edinburgh Essays, physical and literary*, published in 1771, in which the Clay-Marl, the Shell-Marl, and the Stone-Marl are minutely examined and analysed, none of them appear to contain above $\frac{1}{4}$ ths of calcarious Earth, the rest is Clay and Sand, and sometimes Iron, in different proportions.

of *Lac Lunæ*, seems to be no more than a plain calcarious Earth, tho' its whiteness seems to indicate it to be one of the purest.

It is more technically denominated by *Hill*, *Marga fungosa friabilis, albissima, levis*, and *Terra Sceleneusiaca dicta. Stenomarga Agricolæ*; and is adopted in the *Paris Dispensatory*, under the denomination of *Agaricus mineralis & Medulla saxi & Lac Lunæ*, having been used antiently by Physicians as an astringent, and by the Ladies as a Cosmetic, for which last use it is recommended by *Dr. Plot* from experience.

It is found, says *Hill*, wherever there are quarries of Stone throughout the world, as far as can be learned from accounts, whose description will give a clear idea of it, and therefore I shall here adopt it, viz. "It does not constitute a Stratum of itself, but is found in the perpendicular, horizontal and other fissures of the strata of quarries, and on the roofs of others, being a fine, white, porous and friable substance, staining the fingers and adhering firmly to the tongue, soft to the touch, melts freely in the mouth, and leaves not the least harshness between the teeth: thrown into water, it sends up a number of bubbles, with a hissing noise, and instantly diffuses in it, and gives it a milky colour."

It is very frequent in this county, v. g. at the *Green-hills* are streaks of it as white as milk;
running

running across the gravel pits, and lining some of the cavities in the banks : and at a quarry near *Lucan*, the grey building stone was covered with it : and at a quarry near *Oxmantown-Green*, at the depth of two and five feet from the surface, were streaks of it, of a thickness of $\frac{1}{4}$ to $\frac{1}{2}$ an inch, mostly running parallel to the horizon, sometimes intersecting each other at right angles ; and in several other different parts of the county, in pits of Limestone-gravel.

It makes a strong ebullition not only with the mineral Acids, *Aqua fortis* and Spirit of Vitriol, but even with Vinegar, and stronger than Limestone-gravel did upon the comparison.

It scours Brass and Silver very well,

Of S A N D,

And its Varieties and Uses in Agriculture, and for Mechanical Purposes, &c.

THIS City abounds with Shells from our great use of shell-fish.

Shells are an excellent Manure, even unburnt, in boggy, heathy, wet, clayey or stiff land, especially where the surface is Turf, but not in sandy ground.

They seem to give the land a sort of ferment as barm doth to bread, opening and loosening the clods, and by that means making way for the roots to penetrate, and the moisture to enter into the fibres of the roots.

This Manure continues very long, the shells melting a little every year until they be spent, and melting more slowly, and therefore lasting longer than Lime.

Now as Sand is frequently found mixed with Shells, and particularly Sea sand, a very useful Manure is supplied from it, *v. g.* the Sand from *Howth*, which has a mixture of shells
in

in it, and effervesces with Spirit of Vitriol, and whitens water more than *Wicklow* sand, as does also the sand of the *Doder* near *Templeoge*, and the sand at *Booterstown*, having minute fragments of shells in it, and near *Skerries*, where it is used for a manure, I found it full of broken shells, and when dry it made a strong ebullition with Spirit of Vitriol; and it is found to be an excellent Manure on Rye land, or that which is called four, cold barren Clay, which bears sorrel and heath, and no oats, which by this Manure is so far meliorated as to bear Wheat and Barley, and the rent hereby is advanced from 2 s. 6 d. to 12 or 14 s. per acre.

Moreover, the Sea sand is found also to improve, even some of the sandy Soils, viz. by bringing a better Sand to a worse.

Of SEA SAND as a Manure.

It is but of late years introduced here as a Manure, on the coast near *Rush*, *Skerries*, *Balruddery* and *Gorminstown*, where it is greatly used, and experienced to be better than Marl in their clayey, stiff soils, and a particular excellency of it is known to Gardeners and Florists in killing Grubs.

Now, as the good effects of Sea sand is evidently owing to the ingredients composing it, viz. 1 st, to the Sand strictly so called; 2 dly,

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to

to the Salt of the sea combined with it; 3 dly, to the Shells and sometimes to the fragments of Limestone or Spar mixed with it.

Nevertheless, it is to be noted that Sand is also to be admitted as a Manure, without either Salt, Shells, or any calcarious or sparry mixture. For, near *Garristown* is a yellow sand, having also shining or, micaceous particles interspersed, and which does not effervesce with Spirit of Vitriol, and consequently has no mixture of either shells or any calcarious matter, as neither has it of Salt, but some mixture of iron, as appearing by its reddening, and in some parts yielding to the Magnet on calcination.

Now this Sand thrown on their lands in that neighbourhood has improved their Rye-land (i. e. spewy, moist and clayey Soil) to Wheat land. The reader may see this confirmed in *Smith's History of the Co. of Cork*, p. 385, by the like good effects of a yellowish Saburra or Grit, and a Sand of the like kind as a manure in stiff Soils.

Next, it will be of use to consider the mechanical uses of sand. The first is for scouring Wood and some Metals, for which use that of a sharper grain and freer from a mixture of Shells, answers best. For this we are forced to have recourse to a neighbouring County, *viz.* for the *Wicklow* sand, which is used for scouring Pewter and Wainscot, tho' near a-kin to it, is that
on

on the shores of *Bray* and *Killeny*, causing no effervescence with acids, as that of *Howth* does, and so this last leaves the Wood dirty, and a-kin to this last is the sand on the shore of the river *Doder* near *Templeoge*; but

The *Wicklow* sand agrees to *Hill's Arena crassissima splendida pallide fulva*, being used not only for scouring Wainscot and Pewter, but sometimes copper and brass: being shook up with water, it leaves the Water clear. We have other sands specifically different from this, *v. g.*

1. That which is called the *White Freestone-Sand*, from the mountains near *Ballynascorney*, which is brought to *Dublin* to strew on the floors in Gentlemen's houses, being white and shining, and not imbibing the moisture of the air like Sea-sand.

2. A white Sand of an impalpable grit, and withal shining, as from what we call *Fire-stone*, more thoroughly rotten or most minutely pulverized. It scoured brass and silver well. It was found in a bank near the break of *Glas-a-mucky*, and with us should be called *Firestone sand*, but technically speaking, it is the *Arena micacea* of *Hill*, or Sand properly so called intermixed with the *Mica*.

3. Near a-kin to this is what we here commonly call *Freestone*, or *rotten Fire-stone*, being

D 2

another

another of the mountain commodities brought to *Dublin* for cleansing and whitening Wood. It differs from the *English* Freestone, (D) which is a *Lapis arenarius*, tho' the dust of this last has the same effect in scouring boards and wooden vessels as our rotten Fire-stone above-mentioned.

Several Specimens of this Fossil occur, and it is used for the same purpose, but differs from several of the *Saxa arenarea* in *De Costa's* History, being not calcifiable nor causing any effervescence with Acids, as at the bottom of the mountains near *King's-town* and *Titnock*, on the road going from *Bell-alley* to *Mill-town*, and near *Kilmasheoge hill*. Some of these whitened the fingers: and in a Cave on the shore S. E. from *Dalkey*, and at the breaks of *Glassamucky*, and at *Glancullen* and several places in that neighbourhood; but particularly, on the lands of the *Man of War* is an excellent sort of this our Free-stone, and in great quantity. It is sandy, but of a finer grain than the common, has a tincture of yellow, does not effervesce with Acids, when fresh dug is somewhat unctuous, and used with Lime for coarse plaistering; but its chief use is for scouring boards with warm water: it takes grease out of them better than soap, and leaves them polished.

4. Next,

(D) I met with one instance of a Free-stone like the *Portland-stone*, and which was truly a *Saxum arenarium flavescens*, being found in a Wall, and probably supplied from a neighbouring Quarry at *Milltown*.

4. Next, that for the use of the *Founder* deserves mention, as requiring a particular constitution, v. g. the *Arena crassior, lutea hebes*, p. 557, 558 of *Hill's History of Fossils*, which leaves a little yellow muddyneis in water, and is proper for casting Sheet Lead: for "coarser would make the surface of the Sheet-lead too rough and unequal, and a finer would be discomposed and driven into heaps before the running mass." (E)

Of this sand several specimens were found in this County, as at *Milltown* being smooth and having some degree of a cementing quality; another from *Lazer's-hill*, which last and the first are said to be advantageously mixed for this purpose, one being more, the other less binding: and at *Knockmaroon* is a little pit of it, and in the *Deer-park* near *Dublin*, and on the banks of the *Doder* near *Rathfarnham* bridge.

I am moreover informed of another important use of the sand called *Founder's sand*, viz. that it vitrifies the Lead, by which means it makes a fine paste for glazing Earthen-ware, being mixed in the proportion of one part of this sand to two of calcined lead, and thus it gives a reddish cast and lessens the expence by rendering a less quantity of Lead necessary.

5. The next use of sand is for making Glass, for which purpose the *Arena splendida tenuis albicans* of *Hill*, being what is commonly used in writing,

(E) *Hill*.

writing, serves for making much of the white Glafs, commonly called *Flint-glafs* in *England*, tho' it scarce affords so clear a Glafs as Flint.

The last and very important use of sand is, for cementing of stones, being mixed with Lime, for which the fresh water sand is always preferred, the Mortar from sea sand growing damp in moist weather : and here I shall subjoin some judicious and very useful observations, which by means of my good Friend *Patrick Bride*, Druggist, I procured from *Thomas Covey*, a most ingenious and experienced Architect, having been employed in building many of the noted Forts and Barracks in this Kingdom.

“ The Sand that is taken out of a Lough near *Eyrecourt* in *Connaught*, and used in building an adjacent barrack, is the best sand, for its clearness and sharpness that I have seen in the Kingdom.”

The Writers on Architecture do not seem duly to have attended to the cementing materials proper to the Climates in which their buildings were : For, where the sand is clearer and brighter, less loamy and less damp, as in the hotter countries, less Lime is required ; and so our clearest and best sand requires at least part $1 \frac{1}{2}$ to part 1 of Lime ; but when the sand is more moist and loamy, twice the quantity of Sand to that of Lime is required. For the best Sand for Mortar,
is

is the sharpest, or that which has points and corners in it, resembling Salt in form, and seems in some sort to hurt the hands when rubbed between them. Now the quantity of Lime necessary to temper up a mortar with such sand should be no more than what runs into the interstices of those grains of sand when their corners or points are linked into one another; by which means it is a folder that ties together the bodies of those grains, and makes the whole mass compact; and it is plain that the interstices between these angular parts are less than the body of the sand, and therefore that a less quantity of Lime should be used; but if a greater quantity of Lime be put in than is necessary to answer this end, it then keeps asunder those points and corners that should link and bind into each other, being the principal feat of the cementing quality, the Lime being no other than the glue or folder that ties them together.

It is usually admitted as a maxim, that fresh water sand is the best for use; but this is liable to exception: for where there is a running stream, there is by force of the current a constant friction of the particles of sand one against another, (and this will be more the case of rivers situated by the Sea and agitated by the tides) which rubs off those points and corners which make them tie into one another, and the sand becomes round and pebbly, and its particles more apt to separate from one another; and accordingly I have observed

served the difference between these sands have appeared thus: Lay up a heap of the Pebbly Sand, and another heap of the sharp or cornered sand: the least hard wind will blow about the first, but scarcely move the second.

I cannot illustrate the nature of this difference better, than by observing, that if you put your fingers among a parcel of nails, their points and the edges of their heads will so link them together that you will take up a large quantity, whereas if you put your fingers among a parcel of boys marbles, you will hardly bring up more than your fingers can contain: and such is the difference between the cornered and pebbly sands; whence appears the superior cementing quality of the first. Accordingly, the best sand for the purpose of a cement is, that from a River or large Lough which swells but once a year with the floods, and as it falls it gently brings off the loam and sediment, this Sand having no constant friction, which is the case of the Sand from the Lough above-mentioned; and *Lough Neagh* affords a Sand of the same binding quality.

The binding quality of the Cement used by the antients in this kingdom appears in many of the old Castles, and is a matter of admiration, the Mortar standing the waste of time and weather equally with the Stone whereof they are built.

built. Now I have observed, in examining closely into the walls and mortar of these old buildings, that the antients used what we call *Grout* in their walls, i. e. a liquid made up of the clearest, sharpest Sand and Lime, and in every course of Masonry this liquid is poured in, and fills up all the cavities that are between the stones, the mortar being then fresh and moist, unites and causes the whole to inclose and bind about the stone in one compact mass, and as the wall dries, the more strong the Cement becomes. The old Walls demonstrate this, for it is rare to find any cavity in them but what is filled up with Cement so compact and close as could not be conveniently done with a trowel.

There is indeed one objection against *Grouting*, viz. that the Walls will remain moist on the inside until all the liquid is dried up, and continue so for some years, which will make the building not immediately habitable; but this inconvenience our forefathers dispensed with for the sake of having walls that would stand for generations."

Of C L A Y.

CLAY simply is also applicable as a Manure to sharp, sandy or gravelly Soils, especially the yellow and white Clay: and where other Manures are scarce, it is burnt in Kilns for this purpose, a species of Husbandry practised in the Co. of *Cork*. Brick-clay will answer the purpose; it must not be burnt too much, but be reduced to a reddish powder.

Potters' Earth also in sandy ground and such as does not hold water, binds and stiffens it.

At *Rush* and near it, where they have no Dung (having no cattle) they apply Sea-Sand to their Clay, and to their Sand add Straw cut small and Sea-weed rotted together: and at *Rogan's-town* for the same reason, viz. on account of their having no Dung, they use for Manure Straw steeped and rotted in water: but to return to Clay; its mechanical uses next deserve consideration.

1st. For making Bricks. The Bricks manufactured here are generally bad, being far inferior to the *English*, which are redder, more compact and durable, whereas many of the present buildings

ings made of ours must necessarily soon tumble down; for our Brick-clay as well as some of our Potters'-clay, has frequently a mixture of calcarious earth, called Lime-wash, which after burning flackens on moisture, and spoils the manufacture; and another reason for the badness of our Bricks is, their being wrought up too hastily, or not suffered to lie long enough to grow close, as they do on being kept.

This matter is now happily explained by the diligent Researches of modern Naturalists, particularly those of *Woodward* and *Emanuel de Costa*, who observe that the Brick-clays in *England* are always dug up and exposed to the air nine months before they are used, by reason that the *Pyrites* being found in great quantities in them, especially those of *Surry*, *Kent* and *Middlesex*, the said Clays are ever full of the vitriolic salts of that Mineral, which they drain or clear from them by exposing them to the air and weather, that the Bricks may be more firm and durable; otherwise, if the Salts were not drawn forth before the Clay was baked, they hinder its setting in well in the kiln, and are apt to lique afterwords, and so make the Bricks and Tyles moulder and decay; so that the neglect of a proper attention to this is one cause of the badness of our Bricks, as their mixture with calcarious Earth is another.

Another Subdivision of Clay distinct from the former is that which serves for the use of the *Potter* and *Tile-maker*, which having less Sand

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than

than the Brick-clay, and being tougher, bends more easily to any shape, as in making Pantiles.

A. D. 1745. The *Baldoyle* Clay for this use was but of a few years discovery, our Potters'-clay having been supplied from *Merrion* and *Clontarf*: and the Clay of *Merrion* and *Baldoyle* have been mixed for making Pitchers, and the composition was reckoned an advantage.

There is a good Manufacture of this Clay at *Mullynahac* in *Dublin*, viz. of excellent black Crocks, Pantiles, Ridge-tiles, and Flooring-tiles, and Flower-pots, Sugar-moulds and Drip-pots for Sugar-bakers.

Clay for Pantiles was formerly got at *Castle-kelly* and at *Old Bawne*.

The imperfection of our Pots made of these Clays however, compared to the *English*, is acknowledged: Ours indeed, if properly seasoned and brought gradually to the fire, will boil water well, but do not bear the naked fire, tho' according to my informers, there is no doubt but our Pots might be made as good as the *English* if more encouragement were given them, which is the more necessary by reason of the dearness of Coals here and of Lead, an article essential to Vitrification; the quantity of which they are stinted in by reason of its price.

One

One use common to Brick-clay and Potters'-clay is, to take spots of Grease out of Clothes.

Next, it may be worth observing that the yellowish and red Clays owe their colour to Iron, for which reason *Aqua fortis* extracting and dissolving this leaves the Clay white.

The *Smeetic Earths*, as *Fullers' Earth*, agree to and are, particularly the last mentioned, superior to the Potters and Brick-clay in taking spots of Grease out of Clothes.

Of T U R F.

TO Clay as a Manure may be added *Peat* or *Turf*, viz. the powder alone or mixt with dung, being a proper Manure for stiff, clayey Soils, as it is full of small fibres or roots, which rot and turn to earth: thus used on a land of Brick-earth, it has been known to produce extraordinary Crops.

Merret in his *Pinax* denominates it *Cespes bituminosus*, a denomination proper enough to such earths as have imbibed the bituminous steams, as others have the ferrugineous, manifested by
their

their red ashes; and indeed most of our Bogs seem to contain a Vitriolic Juice; for it is observed of the roots, bodies and branches of oak, alder and other forest trees, that tho' soft when first raised, they become useful timber when dry, but always black.

But the Turf which supplies *Dublin* is more simple, yielding white ashes, and is brought chiefly from the mountains South of *Dublin*, being less solid than that which is got in low lands. (F) Such also was that of *Glanasmole Glynn*, where it was their grand staple commodity, and some of that from the neighbourhood of *Castlekelly*, from *Glancullen*, and part of that from *Garristown-bog*, where however are three varieties of it: the first and least valuable has Ochre-like spots interspersed thro' it. This stinks in burning and yields red ashes. 2. A light sort. 3. A solid, compact, black and ponderous sort, an excellent fuel almost equal to Sea-Coal, is long kindling, but burns long, and does not emit a blue flame, and the ashes of this and the second are white.

So

(F) I have before observed that the Soil of the County is but very little boggy; and even in all the mountainous tract from *Rathcool* to *Brittas* there is no Turf at all, but what they call *Scrawes*, being prepared from the Sod, which being naturally mixed with heath, after being dried about ten days in the Sun, makes a very hot blazing fire for the Peasants, and the ashes supply them with a good manure, preparing the ground for Potatoes, as these do a subsequent crop of Oats.

So from the mountains of *Cruagh* and *Kippure*, the Turf of one mountain gives white ashes, that of another red : but

In the Glyn of *Holywood* is a Turf which is said to burn blue and stink, and leaves red ashes; and at *Hayes-town* bog and *Knock-bragg*, the first near *Holywood*, the second near *Curtlagh*, is a Turf which stinks in burning, and yields red ashes, even from the ferrugineous and sulphureous steams imbibed, which steams are so considerable, both in this neighbourhood and at *Garistown* as to furnish two Chalybeate waters described in my History of the *Irish* Chalybeate waters. (c)

N. B. The red ashes of Turf, mixed with water, serve the purpose of Raddle, to mark sheep from the ochreous admixture.

(c) *Cronstedt* in his System of Mineralogy pronounceth this to come nearest to Pit-coal, and that it often contains a little of the Vitriolic acid.

Lime.

Limestone Gravel.

THERE remains yet one article among our Manures which demands a particular consideration, *viz.* Limestone gravel. It is a Petrification reducible to the Class of the *Saburra* of *Hill*, tho' not distinctly described by him. It consists of Masses of Stones, Pebbles and sometimes Slate and Ragstone cemented or conglutinated together as by Mortar. It deserves a particular consideration, as it abounds with us, and particularly in this county, even in all parts of it, *y. g.* at the *Green-hills* near *Dublin*, where some of the Roads are like Terras-walks by means of this Gravel, whose excellency is in its binding, cementing quality, and at or near *Newcastle* is said to be one of the most binding Gravels in the kingdom : and at *Dunleary* are large Rocks of it.

It hardens in the air like the *Osteocolla*.

In the *Complete Body of Husbandry* lately published, mention is made of a marley Loam mixed with Pebbles, supplying gravel to walks, and useful as a manure in clayey soils, which comes near to my present account of our Limestone gravel, which as I am informed, is found in *Derbyshire*, and some of the Northern neighbouring counties, but very rare in other parts of
England,

England, infomuch that their Gravel has so little of the cementing quality, that they are frequently obliged to mix Loam with it.

Our Limestone Gravel always makes an ebullition with Acids, which accounts for its Magnetism with regard to the Acid in the Air, and with it forming the calcarious Nitre, an allowed principle of importance in the promotion of Vegetation; accordingly the first specimen I got of this Gravel in this county had a fine, thin white saline crust on it: to obtain which it is necessary that it be laid out to be exposed to the Air, else it fails in its good effects; (H) for be-

(H) Dr. *Ainslie*, Author of the Article on Marl in the *Edinburgh Essays physical and literary*, published in 1772, opposes the vulgar notion of ascribing the fertilizing quality of Marl to the nitrous salt formed by its attraction of an Acid from the air; and indeed to ascribe this principle hereunto, were attributing too much to it; as on the contrary the excluding it from any share herein were attributing too little to it.

Certain it is that saline efflorescences, even by the Author's own testimony, are found upon Marl; and by my own observation upon Limestone gravel: Now Rain-water or Dew passing over these will become saturated with their solution, and thereby be improved in their fertilizing quality.

Modern experiments have determined that Plants grow and blossom in meer Rain water, and that when set in Earth, this last loses nothing of its weight upon the Plants having grown to Perfection, the Rain-water being not a meer vehicle, but furnishing matter for the growth of Vegetables, supplying them with the calcarious Nitre, and absorbent earth, and a phlogistic or oily matter; and as Dew in all experiments affords a greater quantity of solid Contents than Rain-water, its superior fertilizing quality is hence accounted for; and this will be still further improved by the additional impregnation of the aerial Nitre.

side the use of it on account of its binding quality in gravel-walks in gardens and in the high roads, it is also of great and important use as a manure: and this appears to have been an antient practice revived to very good purpose of late; for near *Glassamucky* are the remains of old Pits that have been formerly dug for it.

Its use as a manure, is chiefly in the stiff clayey Soils: It has indeed in the too loose, sandy and gravelly soils also succeeded better than Dung: but it is more eminent for improving mountainous, boggy and clayey ground, and wet bottoms, the water being previously drained from them, and proves a better and more lasting manure than Marl, mellows the stiff clay, correcting the tenacity of the Clay, meliorating the juices of the earth, and producing the white and purple Trefoyl, where four Grass grew before, and excellent Corn and doubling the Crop. So in the mountainous, boggy and clayey Ground near *Rathcool*, the lower part of their mountains by means of this manure bears Barley, Wheat and Pease, which else would not grow here, requiring a richer land, and so by means hereof their Rye land is turned to Wheat land: but that it may answer these good purposes it must be ploughed in with the fallow, and with it exposed to the Summer sun; for if it be not laid out so as to have the benefit of the air, it fails in its good

good effects. For a further account of the Operation of the Air in promoting Vegetation, I refer to *Home's Principles of Agriculture and Vegetation*, printed in *Dublin*, 1759.

Of binding and lapidescent Earths.

I. **A**T *Boransdown*, near *Garistown*, is a certain binding Earth or rather Loam, which being wrought up into paste with water makes good Floors. It is brown and of the colour of pale Ochre, with veins of blue, with a very fine grit or a soft impalpable sand mixed up with Clay and a little Ochre.

It made no ebullition with Acids.

It scoured Brass and Iron very well.

On calcination it became of a pale red within, and in some few parts yielded to the Magnet.

It resembles the *Terra miscella fusca* of *Emanuel de Costa*. *Thraustomichthes durissima fusca* of *Hill*, which burns to a deep red, and is used in floors of barns and ovens, and when well

beaten together dries into a very firm hard mass, of very little less hardness than *Plaster of Paris*, and bears the weather extremely well.

2. Between *Castlekelly* and *Old Bawn*, was found an Earth intitled to the above appellation, tho' a terrene Spar or *Cibdelostracium* of *Hill*, being quite different from the last described Earth or Loam; for this made a strong Ebullition with Acids, and it acquired a stoney hardness on being kept a few days.

3. To the same Class of lapidescent Earths, or according to *Hill*, *Terrene Spar*, belongs a kind of rotten Stone found in a quarry at *Dolphin's-barn*, which seemed as it were to vegetate from a basis of Clay.

This also excited an (1) Ebullition with Acids.

Of

(1) Near a-kin to the above-mentioned is a certain Earth found near *Naas*, in the Co. of *Kildare*, which is cut out with a Spade, and in the air acquires a stoney hardness, and is used in buildings. It makes a strong ebullition with acids, and burns to Lime, and is then with water made into a Plaster, like *Plaster of Paris*; it is partly fistular, seems to be a species of *Osteocolla*, which also hardens in the air as well as Limestone gravel.

Of the Osteocolla, or Bone-binder, or Bone-glue.

AS this has an affinity to the foregoing Earths in hardening in the air, I shall here subjoin a short account of it.

It is a terene Spar according to *Hill*, or a Spar destitute of all brightness, usually coating over vegetables and other bodies in the form of Incrustations. I found several specimens of it in this county, *v. g.*

1. On the banks near *Old Bawn*, which was white and had the appearance of a Mushroom, being as it were, a vegetating Petrification incrusting pieces of Wood in its Centre, the remains of which are still visible.

It made a strong ebullition with Spirit of Vitriol, and scoured brass and silver well.

2. The *Lapis Stalagnites Coralloides* on the banks of the North side of the river near *Rathfarnham* bridge; and the river *Doder* near *Church-town*, affords many large, porous, coralliform stones, which are used as ornaments over the arch of the old Church: they are a calcarious matter concreted

creted about some vegetable, and the figure of an Alder leaf was found on one of these.

2. The *Rizolithos radice Populi nigrae. Osteocolla Stelechites* of *Walevius's Mineralogie* : one specimen of which I found in the Limestone quarry near *Cloghran Church*, being the like calcarious matter encrusting the roots of the black Poplar.

Of the Gypsum.

SPaud or *Terras*, p. 314 of *Grew's Museum Gypsum striatum Authorum Germanice Spaad, vulgo English Talc. Gypsum filamentis parallelis compositum Walerii Mineralogie.*

This is annexed here by reason of its superior cementing quality, and is entirely distinct from the preceding Fossils, the *Osteocolla* and the other Earths above, in this, that it makes no ebullition with Acids, as neither does the *Selenites* nor the *Glacies Mariæ*, or *Muscovy-glass*, nor when calcined do they emit any urinous smell rubbed with *Sal Ammoniac*, as *Limestone* and *Spar* do.

It is mentioned here because it is sold in *Dublin*, being brought from *Mullikartan* near *Lisburn*, where it is found in great quantities.

It

It runs in long, white Striæ parallel to each other. It makes excellent Plaister, bubbling and boiling up in the pot over the fire, as the Plaister of *Paris*, and accordingly is used in Stucco-work, in which it is found to be excellent, and even superior to that which comes from *France*, being not liable to crack as that, and gives a cement much more durable under water, as *George Sempill*, Architect, assured me.

It has been sold by our Druggists for scouring Silver. (κ)

Of rotten Stones, with an Analysis of them.

AS to the two preceding Articles, viz. *Gypsum* and *Boranstown* Earth, have been of use in scouring of Metals, it will be no unnatural transition to consider next the Stones called *Rotten Stones*, the *Terra cariosa* of *Woodward*, the use of which Stones is to polish Brass, Iron, Copper, Silver, Wood and Stones, after the use of other rougher materials, as the Emery and the skin of the Dog fish: and sometimes they are previously burnt for this use to advantage.

The

(κ) There is also a reddish sort got beyond *Carrickfergus*, and some of it has a bluish cast.

The *English* has hitherto been preferred for those uses, especially scouring of Silver, to any yet found in *Ireland*; but from the following observations it appears that we may not only be supplied with this article at home, but even that it may be exported to advantage.

We have a great Number and Variety of these Stones in this county, and of different colours, as pale brown, dark brown with red streaks, snuff-coloured, yellow and black, *v. g.* The *Tripela fusca levis*. Light brown *Tripoli* of Hill near *Kilmasheoge*, very frequent there, and which has been exported to *London* in great quantities to advantage.

Others by the river side from *Rathfarnham* to *Old Bawne*, on the road from the *Deer-park* to *Castleknock*, in a quarry at *Oxmantown* green, at *Cloghran*, on the shore near *Baldoyle* and *Malahide*, and many other places, and particularly in the bay of the lower *Corballis*, which is much exposed to the N. W. winds.

Most of these upon trial scoured Brass and Iron, and several of them scoured Silver also, particularly a dark brown one found near *Swords*, of an impalpable grit, which scoured Brass and Silver immediately and excellently, and as well as the foreign sort, and several others had the like effect on both those Metals.

There

There is one difference between the *Tripela's* described in *Hill's History of Fossils*, and ours, that all his *Tripela's* except one, made no effervescence with Acids, whereas the greatest part of ours do effervesce with Spirit of Vitriol, containing more calcarious Earth; and indeed some of our *Tripela's* seem to be no other than a decomposed Limestone, or a Limestone rotted to the centre, and I have observed some parts of the same stone to make an ebullition with Spirit of Vitriol, whilst other parts of the same stone made no ebullition at all with the same Spirit, as though these last were saturated by the corroding Acid of the air, and the others not.

But tho' Limestone, or the calcarious Earth be allowed to constitute great part of our rotten Stones, yet this is frequently found combined with Iron, which, especially when the Stone is calcined, manifests itself by flying to the Magnet, and the particles of each are so minute as not to scratch the Metals, as they do when there is a mixture of sand in them.

I confess the above account of our *Rotten Stones* is different not only from those of *Hill*, but likewise seems to contradict the sentiment of *Cronstedt* in his late system of Mineralogy, who deems the *Tripoli* to be a mouldered siliceous Earth; however, the Experiments I made on ours are faithfully related, and may serve to establish a Variety in the Stones passing under this denomination.

Of the Lapis Hibernicus and the Pyritæ.

THERE is yet another species of *Rotten Stone*, the consideration of which will properly succeed that before-mentioned, but of a very different nature, altho' the corrosion of both may be owing to the same general cause, the Acid in the Air, which Acid when attracted by the calcarious earth forms the calcarious Nitre, but when attracted by a ferrugineous matter forms the martial Vitriol: of which last species of Rotten Stone, is our celebrated *Irish Slate*, being a kind of decomposed or mouldered *Pyrites*.

I met with a specimen of this on the South side of *Garistown*, and on the road to the Spaw, which is there, being a dark, grey rotten stone, which exhibited the following appearances.

It made no ebullition with Spirit of Vitriol, yet boiled with Milk, disposed it to coagulation.

It burnt reddish, and then some small parts of it were attracted by the Magnet.

Having been exposed some months in my closet, it was infused in water, which infusion gave a purple tincture with Galls: and after being kept

kept in a bag nine months, it exhibited a white efflorescence of a strong vitriolic appearance.

Moreover, on the S. E. coast of *Loughshinny*, between *Rush* and *Skerries*, are large rocks of the *Irish Slate*, some rotten, others not, some of them very mild and scarce sensibly acid, others acid and austere, and in this place several of them yield Vitriolic efflorescences.

Four grains of this boiled in an ounce of Milk gave an obscure coagulation: and a Lotion of it in water turned blue with Galls, a characteristic of martial Vitriol.

In the neighbourhood of the foregoing, viz. in the hole of the Copper-mine at *Loughshinny*, was found a stone of the same kind, but very austere and strongly vitriolic to the taste, and water poured on it struck blue with Galls, and milk boiled with it was evidently coagulated. Upon calcination it appeared to be more strongly ferrugineous than the former; and moreover, a yellow, vitriolic efflorescence was found on it, very acrid and caustic.

Very near akin to these are the *Pyritæ*, or *Firestones*, being wholly different from another Stone with us called *Firestone*, of which hereafter, the *Pyritæ* being a composition of Sulphur, Iron, Earth, and sometimes Copper, and sometimes Arsenic, especially in the white sort, and the

G 2

yellow

yellow fort often contains a third or fourth part of Sulphur; and their Sulphur acting upon the Iron when assisted by air or water produces Vitriol.

And some of these manifest their Vitriol to the taste, and frequently in a moist air emit efflorescences of the capillary white Vitriol, even as our *Lapis Hibernicus* is observed to do, being indeed a kind of mouldered *Pyrites*.

Marcastes are a subdivision of the *Pyrites*, and distinguished properly enough by the name of *Pyrites chrySTALLISATÆ*, being of some determinate figure, as Cubes, Rhomboids, &c. which may be seen in several of our quarries and some walls in *Dublin*; but I hold it needless to expatiate on these, and therefore return to the consideration of our *Lapis Hibernicus*, being a fossil but little understood, until of late.

I made several experiments in order to investigate the real contents of this stone, as a possible and very probable ingredient in our waters called Chalybeate, the result of which was, that it consisted of a bolar earth, sulphur, a martial Vitriol, and some pittance of Copper (L); of these the Martial Vitriol seemed to be the principal or most active ingredient, as in the above-mentioned Rotten grey stones.

(1.) Methodical Synopsis of Mineral Waters.

Dr.

Dr. *Hill*, however, in his excellent Treatise on Fossils (and to whose merit I gladly embrace this opportunity of paying the just tribute of acknowledgment; and the rather, as he has been the happy means of a further discovery of the real contents of this our *Irish* stone) thinks Alum to be the principal Salt impregnating it.

It must however be acknowledged, as I have elsewhere and here, that there is a considerable latitude and variety in the nature or qualities of the stone, passing under this denomination, both with respect to the different degrees of acidity and astringency, and with respect to the predominant Salt contained, whether Vitriol or Alum; and indeed that this last is also sometimes an ingredient and sometimes a predominant one of our *Irish* slate, and sometimes combined with the martial Vitriol, I am abundantly convinced by later observations, and the rather as they may give a hint (in pursuance of the noble and beneficent designs of the DUBLIN SOCIETY) which may be prosecuted by persons of more leisure to their own advantage and that of the public. Sir *William Petty* speaks of Alum works in this kingdom, and the learned *Lister* (a person well acquainted with Fossils), affirms that he received an Alum glebe from *Ireland*, out of which true capillary Alum did shoot, even as Vitriol from the Pyrites. But tho' those works are long since dropt, I apprehend it to be no way impossible that they
may

may be revived, and in order to encourage such an attempt, I shall here give the observations and experiments I made on several varieties of this stone, and which moreover may serve as an illustration of the real contents of several waters which have not yet been understood, particularly of the late newly-discovered one by Dr. *Peter Layard*, and of ours of *Ballycastle*, *Coshmore*, *Nobber* and *Cross-town*.

A. D. 1750, I visited the coast near *Rush*, a third time, and found several of these Rotten Stones, which gave strong indications of Alum and of martial Vitriol combined with Alum, viz. .

1. One of these, which was mild in taste, was infused in water and boiled to the consumption of half: it extracted a deep red from Logwood, the property of Alum, whereas meer martial Vitriol and our Chalybeate waters always extract a blue from Logwood.

2. A second black Rotten stone found here, and which was of a rough, acid and bitter taste, extracted from Logwood first a red, then an olive coloured tincture, but from Galls a deep blue, indications of a combination of Alum and the martial Vitriol.

But the following appears to be an instance of a predominant Alum with very little mixture of any thing, Vitriolic or Ferrugineous, viz.

In

In the Glyn of *Knockbragg* near *Holywood*, are found rotten, slatey stones, partly black, and partly of the colour of yellow Ochre, some pieces of which were of an austere taste, some subacid, yet acid enough to curdle milk slightly. The infusion in water had no effect on Galls as the foregoing, but it extracted a deep cherry colour from Logwood, and when calcined it struck a crimson colour with Logwood, but had no effect on Galls, which is one indication of Alum, without the mixture of Vitriol.

There are moreover other substances a-kin to this, but which seem to indicate a composition of Vitriol and Alum, on which I made several experiments, and found that they gave two evidences of the presence of Alum, beside their giving every mark of iron, as in the common *Pyritæ*, viz. 1. st. the taste of Alum, 2. dly, the red and crimson tincture they extracted from Logwood; which meer Vitriol never does, nor the Vitriolic Waters, but a blue tincture, and the very same evidences of the combination of Vitriol and Alum do also, upon recent observations, appear in several mineral waters.

The 1 st of those substances was a black Earth, found near the top or surface of a quarry of our black building stone at *Glassnevin*, (of which hereafter) and on the north side of it. —

It

It smelt sulphureous on handling, and was of an acid, austere, vitriolic and withal aluminous taste : It sparkled a little in the red hot crucible, and turned red, and was then a little attracted by the magnet : and 9 drachms, 10 grains, kept in the red hot crucible half an hour, lost only one drachm.

It excited an ebullition with the solution of Pot-ashes, as, with the Alkali both fixed and volatile, it precipitated a large brown ochreous sediment.

It struck blue with Galls and an olive colour with Logwood.

2dly. There is another black Earth called by Hill, *Argilla nigrescens friabilis levis*, Killow, by Emanuel Mendez de Costa, *Black Ore*, and by Walerius, *Humus nigra pictoria* or *Atramentum scissile*, having derived its name from its resemblance to the smut on the backs of chimnies, which is called *Kollow*, (as this is called *Killow*) in the North of *England*.

It leaves a dark line rubbed on paper, and is used for writing and designing, and has been used in marking sheep, and sometimes in Painting:

I met with two varieties of this fossil on the coast near *Loughshinny*, one grey, another as black

as

as coal : this last rubbed on paper leaves a line of a black, the other leaves a line of a leaden colour : they are both of an austere acid taste, more or less, and both, when diluted with water, are smooth to the touch.

The above-named Authors indeed have not given any hint of Alum being an ingredient in their composition ; however I shall shew that they exhibit two indications of Alum being contained in them, viz. 1st. the taste of Alum, and 2dly, the red and crimson colour extracted by them from Logwood : and tho' it must be acknowledged that several hard waters and some of the purging waters have the same effect on Logwood, yet they have not the aluminous taste as these Substances have. 3dly, There is a Grey sort, which is weaker and less acid than the black, causes no ebullition with *Magnesia alba* diluted with water, but upon standing gives some brown ochreous precipitate : In two different Experiments a strong decoction gave indications of a combination of martial Vitriol and Alum by turning blue with Galls, and of a deep crimson colour with Logwood, tho' in a third Experiment it turned of an ink colour with Galls, and not a crimson, but green colour with Logwood.

In two other Experiments it agreed not entirely to Alum ; for whereas Oil of Tartar precipitated a white sediment from the decoction, and spirit of Hartshorn a white yellowish one, both

these precipitates effervesced with acids, whereas the precipitate made from a strong solution of Alum by Oil of Tartar makes no effervescence with Acids, so that here the *Killow* decoction does not agree to a solution of Alum, but yet the white insoluble matter, which was left in the filtre upon straining a strong solution of the grey *Killow*, made no effervescence either with Aqua fortis or Spirit of Vitriol, being a bolar earth and such as is allowed to be the basis of Alum.

But the *black* fort is more strongly impregnated with these salts, being of a taste more strongly acid, austere and plainly aluminous, and the evidences of Alum combined with Vitriol in it are much stronger: for 1. In a simple infusion of it in distilled water, Logwood gave a red tincture in the upper part of the mixture, but Galls gave very little tincture. 2. In two other Experiments on a strong decoction this combination appeared by the blue tincture with Galls and the crimson with Logwood. 3. In another specimen a strong decoction gave more manifest tokens of Alum than of Vitriol: for it struck a lasting bright crimson with Logwood, before it struck the ink colour with Galls, otherwise than in the two last Experiments.

This reasoning is farther illustrated and confirmed by Dr. *Hill's* testimony concerning the *Lapis Hibernicus*, who affirms that he procured $\frac{1}{2}$ part weight of Alum in some of the best pieces
of

of it, as likewise by the account elsewhere (M) given of the *Aluminoſo Vitriolic* water of *Ballycaſtle*, and I would adventure to recommend to perſons of more leiſure a further ſearch for Alum in the Stones and Earths above ſpecified and found in this county: Such a Combination of Alum and Vitriol we are aſſured by the accurate *Macquer* in his Elements of Chymiſtry is frequent, and *Liſter* affirms, that in *England* ſcarce any Alum Mine is found without a mixture of the *Pyrites*: and *Macquer* moreover gives the method of ſeparating them in theſe words: “ Alum is almoſt always accompanied with a certain quantity of Vitriol, which renders it impure and obſtructs its cryſtallization; for which reaſon an alkaline lye is added to the ſolution of this impure Alum, which having a greater affinity with the acid, precipitates the irony baſis, and ſo the Alum is left pure and cryſtallizes.”

An attempt of this kind, viz. the ſeparating the Alum from the Vitriol may be further encouraged by the following fact: Some crude Alum-ſtone transmitted to me from *Yorkſhire*, was black, ſlatey and friable, tho’ with ſome difficulty; and tho’ it did not manifeſt any thing either vitriolic or aluminous to the taſte, yet being expoſed ſome months to the winter air, and ſometimes ſprinkled with water, this ſtruck firſt crimſon, and then blue with Logwood, and

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the

(M) Methodical Synopſis of Mineral Waters, Book IV.

the calcined stone, diluted with water, struck crimson with Galls, and blue with Logwood, evidences of a combination of Alum and Vitriol, from whence the similarity of the *Yorkshire* stone with ours above described appears, and which, as they know how to separate these salts in *England*, there is the strongest reason to suppose that this may also be practised here.

O F

Ochres and painting Earths.

OCHRE is an article of importance for Painting and for colouring Gloves and Skins yellow and brown, with which we have hitherto been supplied from *England*, but by the following enumeration it will appear that we might easily be supplied from home, and Mills might be erected here as well as there for washing our Ochres, and separating them from sand and dirt. In the Co. of *Wicklow* they have lately extracted Silver from some species of the Ochre.

By this term we generally understand painting Earths: However, *Emanuel Mendez de Costa*, upon a review of *Hill's History of Fossils*, chooses to give this definition: "Earths slightly coherent,

rent, ponderous, composed of fine particles, rough to the touch and readily diffusible in water" and criticises on *Hill* for confounding Ochre with Clay, when he gives to one of these substances the appellation of *Ochra argillacea sordide flavesceus*, which is a Clay of *De Costa*, and by him called *Argilla lutea improprie Ochra dicta*, being very viscid and tenacious, when moist contrary to the character of Ochre, and moreover acquires a great hardness in the fire, which answers to the character of Clay, whilst at the same time it is of great use in painting, and he gives two more like instances of Clay, and one of Marl being a painting Earth, so that Ochre and painting Earths should not be convertible terms: nor moreover is the Effervescence or Non-effervescence with Acids, the proper criterion of the painting from the calcarious Earth, since several of the former do, and others do not effervesce with Acids.

Charles Smith, Author of the natural and civil Histories of the Counties of *Waterford*, *Cork* and *Kerry*, supposes that Ochre may be formed by a small portion of Iron Ore mixed with Pipe-Clay, having found in his search for Pipe-Clay in the Co. of *Waterford*, that it became yellow in proportion to its nearness to Iron Ore; but I imagine that the various tinges in Ochre may be better explained or at least illustrated by different degrees of the vitriolic acid mixed with Clay; for I found in a very pale Ochre brought from the
neigh-

neighbourhood of *Rufh*, which made no ebullition with Acids, and which had only the flightest tinge of yellow imaginable, that a little spirit of Vitriol added to it gave it a deeper yellow, and so another pale Clay in the same neighbourhood, on dropping either Spirit of Vitriol or Nitre on it, turns yellow: and a certain white Earth in the same neighbourhood turns blackish by adding either of those Acids; and the black unctuous Earth called *Killow* (and which *De Cofta* reduces to the class of black Ochres) appears by all experiments to be no other than an unctuous Earth, more strongly impregnated with the vitriolic or aluminous acid. (N)

Dr. *Hill* and *Emanuel de Cofta* reckon up no small number and variety of Ochres, and of different colours, as yellow, red, brown, black, blue and green: and even in this small county, I have found the yellow, red, brown and black.

Some of these cause no ebullition with Spirit of Vitriol and other Acids, being perhaps Clay impregnated with the vitriolic acid, others do make a manifest ebullition with Acids, having perhaps a mixture of calcarious earth; and others own the Magnet but little, others fly to it even crude, and others when calcined, according to the

(N) This is perfectly agreeable to the sentiments of that celebrated Mineralogist *Cronstadt*, who calls these substances, *Minera Ferri calciformis pura friabilis*, and affirms that they are Iron dissolved by the vitriolic acid.

the different quantities of iron contained. Of these I shall give instances severally.

1. A. D. 1745, in a Lead Mine lately opened at *Castleknock*, was found a very dark-coloured Ochre, approaching to Umber, being darker than brown Ochre, and less dark than Umber. It is fine and impalpable, and said to make a very good dark Paint.

It made no ebullition with Oil of Vitriol nor Spirit of Salt.

It grew reddish by calcination, and was then strongly attracted by the magnet.

2. A yellow reddish Ochre near *Dolphin's-barn*, which caused no ebullition with Spirit of Vitriol, and appeared to be chiefly a ferruginous earth: for it calcined of a deep red, and then fled almost wholly to the Magnet.

3. From the neighbourhood of *Rush*, a very pale Ochre, answering to the *Ochra levissima friabilis, pallidissime flavescens*, of *Hill's History of Fossils*, p. 51. which also made no ebullition with Acids.

4. A pale brown Ochre, of which there is a small bed at *Augh Farrel* (where also is a Chalybeat Spring.) This also made no ebullition with Spirit of Vitriol: it reddened on calcination, was
not

not attracted by the Magnet crude, nor but obscurely when calcined.

But I found several other Ochres in this County, which excited a manifest ebullition with Acids, *v. g.*

I. In the Lead Mine above-mentioned at *Castleknock*, in the neighbourhood of that above described, (o) and which I found at the same time; it was a black Earth, with a shade of purple of an intermediate colour, between *Umber* and *Cullen's* Earth. It was tried by a Painter, and pronounced an excellent colour, as it dried with Linseed Oil in twelve hours only, being a much shorter time than ordinary colours do.

It excited an ebullition with Oil of Vitriol, Spirit of Salt, and even with Vinegar.

(o) I have seen a yellowish Ochre, which was brought from *Summer-hill* in the Co. of *Meath*, and but about 20 miles from *Dublin*, where it is said there are many Tuns of it, for which reasons I add it here, and because it makes an excellent brown Paint upon trial, and dries very readily.

It is impalpable, does not effervesce with Spirit of Vitriol: but

It yields very strongly to the Magnet, even crude and calcines to a brown red.

It is very like *Hill's Ochra levissima flava friabilis*, which is frequently thrown out of the mouths of Chalybeate Springs, and this our Ochre is also said to be situated near such a Spring.

On

On Calcination some small parts of it fled to the Magnet.

2. On the Road to *Ballynascorey* a dark brown rotten stone, almost globular, somewhat gritty, and it effervesced with some of the Acids. In its crude state it was scarcely attracted by the Magnet, but when calcined it became black, and was greatly attracted. (P)

3. A hard, yellow, reddish Ochry substance in a quarry at *Dolphin's-barn*, which made a strong ebullition with acids, both in its crude state, and when calcined. (Q)

On the road from *Castle-kelly* to *Old Bawne*, are frequent appearances of Ochre, particularly near *Glassamucky*, a brown one to a great depth, which in its crude state was not attracted by the Magnet, but upon calcination reddened, and then was a little attracted: But

In the neighbourhood of the Chalybeate water in or near *Holywood-Glynn*, were found the three following Ochres richly ferrugineous:

(P) *Emanuel Mendez de Costa* mentions an *Ochra Indica saxea purpureo rubra*; which is brought from the *East-Indies*, and of great use among the painters, being a very valuable colour, and by them called *Indian-Stone red*, but is not acted upon by Acids.

(Q) So the Ochre, called *Spanish brown*, makes a violent effervescence with *Aqua fortis*.

1. One as red as brick, and blackish within, of an empyreumatic smell, and flies almost wholly to the Magnet, even in its crude state.

2. A brown yellowish one, which to the eye appears to be mixed with Iron.

3. A dark brown one: both this and the second in their crude state are but very little attracted by the Magnet, but on calcination they both become red, and then fly almost wholly to it.

Those may be deemed Iron Ores, and therefore the transition from them to Iron Stones or Iron Ores will be easy.

Iron Stones and Iron Ores.

IT hath been justly remarked to the glory of Divine Providence, that as Iron is the most useful, so it is found in far greater abundance than any other Metal; and accordingly Iron stones are very plentifully scattered both on our coasts, and in the inland parts of this county.

And the two following Aphorisms seem proper to be premised to an account of these stones, *viz.*

1. The

1. The red and yellow Earths or Stones generally owe their colour to an admixture of Iron. (R)

2. All Earths that are naturally red, or acquire that colour by calcination are ferrugineous. (s)

Of these Stones some were attracted by the Magnet, even in their crude state, others not until calcined, some excited an ebullition with Acids, shewing an admixture of a sparry matter, and some burnt blue, shewing a combined sulphur, as appears from the following instances.

On our Coast, proceeding from *Raheny* was found a black, reddish, ponderous stone, of an iron colour within, which struck fire with steel, made an ebullition with Spirit of Vitriol, and the powder of it crude was strongly attracted by the Magnet.

And on the coast near *Baldoyle* are many of these Iron stones, some of an ash colour, some red, some olive-coloured, others ochre-coloured, or having ochreous striæ, some sandy, many of which yielded to the Magnet, even in their crude state, and several made an ebullition with Spirit of Vitriol, tho' others did not.

In our journey to *Howth* was found a stone, part of a rock, covered with red rust [ferrugo]
I 2 like

(R) *Lewis*.

(s) *Macquer's Elements of Chymistry*.

like Meal, which rust made no ebullition with Spirit of Vitriol, but was attracted by the Magnet, even in its crude state: And an experienced Miner assures me, that pure malleable Copper was obtained from an Ochry matter found upon *Sutton Land*, between *Baldoyle* and *Howth*.

A red Mill-stone from *Ireland's Eye*; it struck fire with Steel, and the crude powder was attracted by the Magnet, as was an ochre-coloured and rotten Stone found in plenty on the N. E. side of *Lambay* island, and when calcined became of a deep red, and was strongly attracted, and emitted a bluish flame.

Another of these Stones on the coast between *Swords* and *Rush*, had veins as red as blood, especially when moistened.

And on the coast from *Rush* to *Skerries* and *Balruddery*, besides plenty of Iron Mine, I saw several varieties of the Iron-stone which were attracted by the Magnet in their crude state: and on *Holmpatrick* are reddish slatey stones, which are partly ferrugineous.

Near *Loughshinny*, (where is also Copper and Vitriol) a brown rotten stone which made a strong ebullition with Spirit of Vitriol, burnt blue, and on calcination was strongly attracted by the Magnet, being a composition of Spar, Iron and Sulphur.

I ob-

I observed these Stones to be frequent, particularly in the neighbourhood of several of our Chalybeate springs (something like these being undoubtedly the matter impregnating them) as near *Curtlagh*, near *Augh Farrel*, *Kilmasheoge*, and *Holywood*, which also owned the Magnet in their crude state.

A great number and variety of these stones, as red, pale-red, pale-brown, iron-grey, occurred in the more inland parts, as in our walk to *Rathmines*, *Kilgobbin*, *Rathfarnham*, *Grange* and *Bell-alley*: and

On the lands of *Mulahoo* a red ponderous stone is found in plenty, which caused no ebullition with Spirit of Vitriol, and in its crude state was but little attracted by the Magnet, but strongly when calcined, and emitted a deep blue purplish flame, indicating Iron and Sulphur.

But the following substance appears to be much less rich of the Metal, than any of the foregoing, viz.

In a Limestone quarry at *Howth*, are found small roundish *Nodules* of a brown yellow colour, as big as a walnut, but of a stoney hardness: they effervesced strongly with Spirit of Vitriol, and being roasted became as red as brick, but were very little attracted by the Magnet, containing only a small proportion of Iron blended with a sparry matter.

They

They seem to belong to the *Siderorchita* or *Crustated ferrugineous bodies*, minutely described in *Hill's History of Fossils*.

It is said that Iron works were formerly erected in this county, tho' none subsist at present, and on the West side of the Hill of *Howth* Iron mine is found, and on the shore near *Rush*, and at *Loughshinny* on the surface of the ground, particularly a species of the *Hæmatites* or Blood-stone, a red stone described to have botryoid protuberances on the surface, which was attracted by the Magnet even in its crude state. (T)

(T) This Stone is found in great plenty about *Whitehaven* and is one of the richest of the Iron Ores, yielding it is said $\frac{12}{10}$ parts of Iron, and *Smith* in his *Natural and Civil History of the Co. of Kerry*, remarks that in the bloomeries they use about $\frac{1}{2}$ th part of the *English* red Mine to one of our poorer Ores in order to render it less brittle or more malleable than our Ore would be, if used alone.

Of

Of the Native Salts.

THESE are chiefly three. 1. Alum. 2. Two Species of Nitre. 3. Vitriol of Iron.

As to the first, to shew that Alum hath been or may be found here, enough hath been said above; and inasmuch as Iron, as the basis of Vitriol, hath been lately considered, it should seem most consistent with method to give an account of it in the second place; but inasmuch as certain other substances, as Marl and Limestone gravel, have been above previously considered, I choose to give some account in the second place of that Salt which is frequently found upon them, being formed by virtue of that Magnetism or attractive virtue they have with respect to the Acid in the Air, and by which united to the calcarious Earth that Salt is formed.

Of

OF N I T R E.

I Am not insensible that our modern Chymists will not allow of the appellation of Nitre to any other Salt than Salt-petre, but contend that the three principal native Salts being distinguished by the peculiar Acid they yield, no Salt according to them is to be called Nitre but what yields Aqua fortis, which is therefore called the Nitrous Acid: Now it must be owned that the two Native Salts of which I am about to give an account, are so far from yielding this Acid, that the first of them yields the Vitriolic acid, and the second no acid at all, but rather an Alkali, by distillation and otherwise.

Nevertheless, inasmuch as the last named Salt is the Nitre of all antient Authors, both sacred and profane, and is found not only in our Waters, but in our earthy matters, and the other is the calcarious Nitre of that eminent Naturalist *Lifter*, and by him accurately described; and moreover, since both these Salts are possessed of several qualities common to them and Salt-petre, I chose still to retain these so far established Names, and at the same time to give the distinguishing characters of each, which are of recent discovery, and the result of faithful Experiments,

Great

Great indeed hath been, until of late, the Confusion among Authors with respect to the properties and virtues of the Salt called Nitre, they frequently ascribing those of the antient Nitre, and sometimes those of *Lifter's* calcarious Nitre to the modern, tho' each of these Salts be entirely different in their Operation, which mistakes will by this means be rectified; and at the same time some enterprizing Genius may possibly take a hint from hence for an Essay towards making Salt-petre here.

The first then of our Nitres and the most ordinary is, *Lifter's Nitrum Calcarium*, being a very frequent ingredient in waters both plain and medicinal, both here and abroad; and it is also found formed on or near Marl and Limestone-gravel, and on Limestone both crude and calcined in Mortar, and likewise on some of our black, rotten, slatey stones, called *Stegania* by *Hill*, which last I found in a quarry at *Dolphin's-barn*, and between *Rush* and *Skerries*, and at *West-town* near *Naul*: and *Allen*, in his Natural History of the purging Waters of *England*, observes, that it ever appears on the Earths in their neighbourhood.

It has commonly an appearance like Hoar-frost, sometimes is seen in the form of a white incrustation, sometimes in *Strizæ* [Icicles] and sometimes like soft mould.

It is generally of a brackish and bitter taste, and impresses a sense of coldness on the tongue.

It makes little or no ebullition with Acids.

It is said to yield an acid Spirit like Spirit of Sulphur, on being distilled from Oil of Vitriol.

It gives a white sediment by adding either the fixed or volatile Salts to a Solution of it.

Syrup of Violets becomes of a pale green soon fading on being rubbed with it.

It extracts a deep red tincture from Logwood, and mostly a greenish one from Galls.

It imparts some redness to Beef and Mutton, but less than Salt-petre.

Steeped and boiled with Cale, increases the greenness, but less than the antient Nitre.

That from the rotten black Stones did coagulate with Milk strongly, but that from Walls plaistered with Lime had not this effect in so great a degree.

It melts in blisters like Alum on the red hot iron, but makes no deflagration on that nor on Coals.

It

It requires a very large quantity of water to dissolve it, being greatly loaded with terrestrial matter.

The figure of its Crystals is described by *Lifter*.

It is purgative in operation like *Epsom* Salt.

Upon the whole, the Calcarious Nitre appears to be for the most part a Calcarious Earth dissolved by the Acid in the air.

2. The second species of Nitre is found also in Limestone quarries, but is more rare, and for the difference of its qualities merits a distinct consideration, being indeed truly the Nitre of the Antients, or that which was principally known to them by the name of Nitre, to which it agrees in the properties ascribed to it, as far as handed down from them to us.

This, in the language of the modern Chymists, is the fossile or Mineral Alkali, not deliquiating in the air as the vegetable Alkali, but capable of being crystallized, and indeed the figure of the Crystals are not much different from those of *Lifter's* Nitre, tho' it otherwise differs greatly from that Salt.

Several learned Authors have made mention of it, particularly *Leigh* and *Grew*, besides some others in more recent observations, partly as

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found

found in Mineral Waters, and partly as found on Walls and Caves, and in Limestone quarries: (u) and a specimen of it shewn to a medical Society in *Dublin* by the ingenious Dr. *Purcel*, has enabled me to give a more distinct account of it. It was found on the Walls of a House lately built in *Dublin*, A. D. 1769, and the following Experiments and Observations having been made agreeing to the Observations of the Authors above-named on a Salt of the same kind, and clearly shews its alkaline quality, and its agreement to a specimen of the same Natron formerly exhibited to the said Society, brought from the Pike of *Teneriffe*.

Now this is evidently a Salt specifically different both from the above calcarious Nitre, and from Salt-petre: For,

1. It has a strong urinous flavour, with a somewhat saline and bitterish taste, the bitterness far less intense than in the other calcarious Nitre, with a coldness in the mouth like ice.

2. Rubbed with Sal Ammoniac it emits an excessively pungent smell, tho' not rubbed with Salt or Oil of Tartar, and but little when rubbed with quicklime, shewing a strong fixed Alkali, but little or no volatile Alkali.

3. Its

(v) Methodical Synopsis of Mineral Waters, Book IV.

3. Its Solution exhibits no precipitation with Oil of Tartar nor Spirit of Hartshorn, but continues clear with them.

4. It makes a strong ebullition with Spirit of Nitre, Vinegar, Spirit of Vitriol and Oil of Vitriol, but emits no fume with the last.

5. Rubbed with Syrup of Violets, it turned presently of a bright green: and the phlegm distilled from it *per se*, by an intense heat, had the same effect,

6. Also Oil of Vitriol added to it and distilled, gave nothing of the nitrous, but only the vitriolic acid.

7. Solution of Sublimate gave a red precipitate from the Solution of it.

8. Four grains of it, added to an ounce of Milk, and boiled produced no coagulum.

9. Calf infused with it, and then boiled, becomes more green and more tender.

10. Mutton on which it was rubbed, being laid by two days and then boiled, was red as a cherry and withal tender.

11. The Solution extracted a deep red tincture from Logwood, and

12. A deep yellow from Galls.

13. It

13. It does not rise in blifters on the red hot iron like Alum, and the calcarious Nitre, yet it sparkles thereon, but does not deflagrate either on that or on burning coals as Salt-petre,

14. It makes a good *Hepar Sulphuris*.

Thus almost every one of these appearances agrees to a fixed Alkali, and indeed to the fossile Alkali which is the basis of the Sea-salt, and I know no other way of accounting for its production but by supposing that the Mortar from which it was taken was made with Sea-sand. I have elsewhere (w) given an account of a Salt like this under the denomination of *Nitrum marine alealinum* which I found on the walls of a Privy-house, where the putrid animal effluvia seem to have concurred to its production. This, as well as the foregoing was undoubtedly a native Alkali, for it had also a strongly urinous taste, was nauseously bitter, somewhat salt, and withall cool on the tongue like Salt-petre: also it reddened Beef like Salt-petre, and its Solution in water made an ebullition with acids, turned of a bright green with Syrup of Violets, smelt pungent when rubbed with Sal Ammoniac, and turned red with Solution of Sublimate.

Of

(w) Methodical Synopsis of Mineral Waters.

O F

Salt-petre, and its Generation
Natural and Artificial.

WE have seen above that the calcarious matter in Earths and Stones acts as a Magnet with respect to the Acid in the Air, which Acid combined with the calcarious matter constitutes the calcarious Nitre above described: and

Upon a strict examination we shall also find that a calcarious matter is not unconcerned in the production of that Nitre, which alone the moderns affect strictly to call by that name, *viz.* Salt-petre; for we are assured that the earthy substance from which Nitre is produced in *Persia*, is a very pale, loose and friable body of the nature of our *European* (x) Marls [which have been described above] and moreover that it is never sought at any depth of the earth, but is always found on earths in form of a bare Cliff on the side of a hill, exposed to the North and East winds [supposed to convey the greatest quantity of the aerial Acid] but that the same species of earth dug at any depths in the flat country, is found not to contain
any

(x) *Hill's History of Fossils.*

any Nitre, and that other earths in the same situations contain no Nitre.

But that the like Calcarious Earth which is as it were a Magnet with respect to the Acid in the Air in the generation of the calcarious Nitre, has also a share in the formation of Salt-petre appears from hence: Dr. *Pielsch*, who published the Dissertation concerning Nitre, which carried the prize of the Academy of *Berlin*, A. D. 1749, observes, that the more knowing of the Salt-petre makers, when they happen to find the calcarious Nitre upon the walls, do not throw it away, but lay it by before the doors of their huts, and frequently pour upon it a lye of some pure alkaline salt, which in a year's time exposed to the air is converted into true Salt-petre: and in *France* (y) vast quantities of it are annually made by boiling in water the matter of old walls, the old plaister of ruined buildings and the earths of Stables and other places where Animals have been fed; and the Earths of Pigeon-houses also afford it: and *Hoffman* cited by *Hill* affirms, that the matter of old buildings moistened with urine, and exposed to the air in a proper situation and under cover, never fails to afford Nitre in a few weeks, and that sometimes to a tenth part of the whole quantity.

Upon

(y) *Hill* *ibid.*

Nitre of the Ancients.	Sensible qualities.	Alcali's.	Acids.
	A strong urinous flavour with a sense of coldness in the mouth like Ice, taste somewhat saline and bitterish.	Clear with Oil of Tartar and Sp. C. C.	A strong ebullition
Nitre of the Moderns or Salt-petre.	Subacid and promotes a discharge of spittle with a sense of coldness like Ice.	Clear	No evident ebullition.
Calcareous Nitre, or the native Sal Catharticum amarum.	Nauseously bitter, brackish, with a sense of coldness like snow in the mouth.	A white sediment.	No ebullition except with Oil of Vitriol.

Upon the whole, it appears that not a calcarious Earth only, but an alkaline Salt is an essential requisite to the generation of Salt-petre, and is indeed its proper basis, as the calcarious earth is the proper basis of the common calcarious Nitre, from whence appears the true reason of a Solution of this last being precipitated by Alkali's, whilst a Solution of Salt-petre, whose basis is an alkaline salt united to an acid, continues clear with Alkali's. But

The distinguishing qualities of these three different Nitre's will be much clearer from the annexed Table, which I thought necessary to affix, because they are confounded, even in some of the best modern Writers.

O B S E R V A T I O N S.

1. **T**HE Nitre of the Antients agrees to that of the Moderns, in its coldness in the mouth, in its encreasing the greenness of Cale, in its reddening Beef, in its boiling smooth with Milk, in its continuing clear with Alkali's, the reason of which is obvious, viz. the Alkali or the Alcaline Basis common to both.

But Salt-petre differs from the antient Nitre, in deflagrating with every inflammable substance, and in making no ebullition with Acids.

2. The Nitre of the moderns, or Salt-petre, agrees to the Calcarious Nitre, or *Sal catharticum amarum*, in its coldness in the mouth, in its encreasing the greenness of Cale, in reddening Beef, and in extracting a deep red from Logwood; but the Calcarious Nitre, or *Sal catharticum amarum* differs from Salt-petre in more respects than the antient Nitre does, viz. in its nauseously bitter taste and purgative operation, in its precipitating a white sediment with Alkali's, in its curdling Milk, and in its melting in blisters on the red hot iron, and not deflagrating on that nor on Coals.

Of

OF VITRIOL.

AS the calcarious Earth is the basis of the calcarious Nitre, and an Alcaline Salt is the basis of Salt-petre, so is Iron the basis of the green Vitriol.

I have before shewn the presence of this Vitriol in the account given of our *Irish* Slate, but there it seems to be sometimes combined with Alum, but I am now to consider it in its simplicity, in which indeed it seems to exist in most of our Bogs: for it is observed that the roots, bodies and branches of Oak, Alder and other forest trees, tho' soft when first raised, when dry become useful timber, but always black, a distinguishing mark of the ferrugineous Vitriol.

Also the native green Vitriol is frequently found about the Mines in the Co. of *Wicklow*, and at the Lead-mine at *Cloghran* in this county, where also Copper was found.

I shall here annex some few Observations which may serve at least to illustrate the gradual process of Nature in the generation of the martial Vitriol.

At

At *Loughshinny* near *Rush* and on the strand, besides Iron-mine in plenty on the surface of the ground, is found Copper Ore, and a Work for it was begun by *Benedict Arthur*, Esq; but not prosecuted; and on the sides of the Rocks consisting in a great measure of Iron Stones, on the coast N. E. from *Loughshinny* we discovered

1. A. D. 1745, A yellow Efflorescence of an highly acid and austere taste, and withal caustic on the tongue, and in the end it seemed to be of a copperish taste; however, it caused no ebullition with Alkali's, nor did the infusion of it turn blue or purple with Galls, nor blue except very obscurely with Sal Ammoniac (which appearance otherwise readily betrays the copper in Ores) nor moreover did it tinge the blade of a knife immersed of a Copper-colour, so that it gives but very little indication of either a Salt of Iron or of Copper.

It seemed to be what some Authors have called a *Chalcanthum* or *Flos Æris*: and *Wormius*, in his *Museum*, describes a *Melanteria* like this, in the following words; *Melanteria lutei coloris ad ostia fodinarum e quibus æs eruitur, modo adsit Pyrites; vim causticam obtinet ut Misy*; and so on the Cliffs of *Dover* hath been found a yellow matter sweating out from a *stratum* of a dark grey colour, which my relator takes to be that sort of earth from which Vitriol is made, which was of so caustic a nature that if only a small piece of it were held
to

to the tongue, in a moment it caused such a sharp and excruciating pain as if a red hot iron had been held to it.

2. Just by this in a neighbouring shaft opened for the Copper-mine was a white Efflorescence partly like snow, and partly in the shape of *Stiriac* Crystals or Icicles, which evidently appears to be true martial Vitriol; for it was of a sweet inky taste, and the solution of it turned presently of a deep blue with Galls, but green with Spirit of Sal Ammoniac, so that this Efflorescence has plainly the marks of mature martial Vitriol, as perhaps the preceding one is an immature one, which seems to be confirmed by the following Observation.

3. A. D. 1748, I revisited this coast, and examined a certain yellow Efflorescence exuding from a species of the *Lapis Hibernicus* (a black rotten stone) which Efflorescence was of a strongly acid taste, and caustic on the tongue, resembling a composition of Vitriol and Alum, (see the account of the *Lapis Hibernicus* above) which seemed to be an intermediate state between that first described and the second; for, tho' it was not sweet as the second, yet it was plain that the acid in this had imbibed some particles of iron, even so far as to have formed a Vitriol (which the first above described yellow Efflorescence did not) tho' less mature than the second, for an infusion of this did also strike a deep blue with

with Galls, as did also a solution of its Crystals, the figure of which approached to that of the Rhomboid; also the Acid in this last was not so far saturated as in the second.

It melted in small blisters on the red hot iron, and emitted a smell somewhat suffocating. In the crucible it burnt blue, and left a substance partly red and partly iron-coloured, yielding strongly to the magnet, so that all experiments concur in shewing it to be a martial Vitriol.

As the foregoing Salts are remarkable for shooting into certain determinate figures, which is also the case of some stones, the transition from those to these seems the more easy, and so I shall proceed to such Stones as are also remarkable for this quality, viz.

Spars,

Spars, Petrifications, Crystals and bastard Gems.

I. OF SPARS.

SPATUM, *Spath* or *Spar* is thus described by *Walerius* and *Hill*: When pure, it is pellucid and colourless, and its particles are for the most part disposed in pyramids or oblong parallelopipeds, and it breaks in pieces of the same figure, calcines in the fire very readily and freely, but does not upon calcination attract the moisture of the air so soon as Limestone, nor heat in water so soon: otherwise in water and with Sal Ammoniac, it exhibits the same appearances as Limestone. It makes a considerable effervescence with Acids, and a violent one with Aqua fortis, and wholly dissolves in it.

Its formation, according to *Walerius*, is illustrated thus: Take Sulphur powdered and Quicklime: boil the mixture in water and filtre the red solution and evaporate in a warm place, and Crystals will be formed like those of *Spatum*, and not soluble in water.

Cronstedt

Cronstedt, in his Mineralogy, remarks that the Crystallizations of the calcarious Spar (being that which I speak of) are more difficult to be burnt into Lime than any other Limestone, and consequently are of no great use in architecture or to the Husbandman: however they may be of real use to any who search for Mines: for we are told that those of a cubical figure indicate Lead in the neighbourhood, and those of a Rhomboidal, Iron: and we have however the joint authority of *Linnæus* and *Hill* for asserting that the different colours of Spars are a sure indication of the quality of the Metal near them, so far that they receive different tinctures according to the diversity of the Metals combined with them, and that the colour always coincides with the rust or Ochre of the Metal, so that the Ochre of Iron gives it a brown, yellow or red colour, that of Copper a green or a bluish.

Varieties of this Body, some pellucid, others white, some yellowish, some tinged with green spots; some brown, some rhomboidal, others shot into Crystals like Nitre, occurred in several Quarries and about the Lead-mines, and on the shores in this county, a minute description of which would be of little use: It shall suffice to refer to *Walerius* his Mineralogy and *Hill's* History of Fossils for the description and Figures of a variety of them.

Of

Of Petrifications, Crystals, and bastard Gems.

AS these are matters rather of curiosity than real use, my account of them shall be but short.

Among the VEGETABLE PETRIFICATIONS which occurred in this county were the following :

1. Moss petrified from some Springs of Waters slowly dribbling down.

2. *Lapides Fungoides* : or *Lapides Fungiti* ; or *Mushroom stones*. A fossil Coral according to Hill. See the figure, *Hist. of Fossils*, p. 642.

3. *Coralloides Stalagmites* ; It is near a-kin to the *Osteocolla* above described, and Hill remarks that all the crustaceous Spars are sometime or other found emulating the form of *Osteocolla*. It is found in large rocks by the river side between *Castlekelly* and *Old Bawne*, and used as ornamental to the Walls and Door-cases of several of the antient Churches. See a further account of the above under *Osteocolla*.

4. *Lapis Stelechites* : A stone resembling the roots of trees. It is plainly a species of the *Osteocolla*.

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M

5. *Lapis*

5. *Lapis Vermicularis*, according to some, as having the appearance of Worms petrified, but the *Tubulares* of Hill, according to whom they are Corals composed of longitudinal pieces of the figures of so many worms ranged parallel to one another in a mass.

6. A petrification resembling a bundle of *Asparagus* petrified, delineated in Hill's *Hist. of Fossils*, under the denomination of *Funci lapidei*.

7. Petrifications having the branches of Plants delineated on them: In our journey to *Corballis* the lower,

Among the ANIMAL PETRIFICATIONS were the following :

Asteria
Astroites } Star-stones.

Belemnites, or the Thunderbolt (tho' some place this among Minerals.)

Buccinitæ. Petrified Whilks.

Ammonites lapis, *Cornu Ammonis*, vulgo, Serpent-stones,

Cochlea petrificata. Snail petrified.

Echinus marinus petrificatus. Sea Hedge-hog petrified.

Entrochi. See Hill & Walerius, being reckoned to have been the joints of the Star-fish.

Lapis

Lapis Judaicus, said to have been found in a quarry at *Raheny*, being supposed to be the spines of the *Echinus marinus* petrified.

Lapis Mytilites. The Muscle petrified; one on *Howth* shore. It did not effervesce with Acids.

Lapis Ostracites. Oyster-Shell petrified. This also did not effervesce with Acids.

Patella petrificata. The Limpet petrified.

Lapis Pectinites. The Scallop petrified.

Pectunculus petrificatus. The Cockle petrified.

Perlæ. Pearls, found in *Poolbeg* Oysters.

Trochitæ, so called from their resemblance to a Boy's top, and said to be articulations detached from the vertebræ of the back of a sort of Sea-worms, in the form of a wheel, hollow in the centre.

Among the Mineral Petrifications are

1. Limestone-gravel, which hath been considered above, under the article of Manures.

2. Mill-stones.

3. A kind of Rock-Marl, or a Petrification resembling an artificial Plaster, but harder on the N. side of the *Liffey*, on the side of a bank

M 2

near

near *Knockmaroon*, and on the banks of the *Doder*.

It broke white within, effervesced strongly with Acids and burnt to a lime.

I received two other specimens like these from the Co. *Armagh*, and near it, where it was used as a rich Manure.

4. Petrifications or stoney Incrustations of vast extent, formed by water dribbling along the rocks upon the stones in a cave on the shore near *Portrane*, where is a petrifying spring.

From the same rocks were collected white stoney Incrustations with a tincture of green: they effervesced strongly with acids and were reduced to a strong lime in half an hour, previously burning blue and purple from the Sulphur, to which the greenish cast seemed to be owing.

Dr. *Hill* calls these Petrifications by the name of *Cibdelostracia*, which he defines thus: "Terrene Spars, destitute of all brightness or transference, formed into thin plates, and found usually coating over the sides of fissures and other cavities of stone, with congeries of them of great extent, of plane or botryoid surfaces."

5. *Lapides*

Lapides Stalactitii : Stoney Icicles, or Drop-stones, or, according to *Woodward*, Spar formed in the shape of Icicles. At a quarry near *Lucan*, and in the two different caves on the N. W. shore of the hill of *Howth*, and one formed by the dropping Petrifying spring on the E. side of that hill.

A clear illustration of the recent formation of these, even from a calcarious matter, suspended in water, and deposited on stagnation, occurs very frequently in Icicles like these, formed on the under side of Arches from the Rain-water, slowly transfusing through the limey cement.

O B S E R V A T I O N S.

I. **H**OW absurd soever the Pythagorean conceit of the transmigration of Souls may be, the above Petrefactions are an evident instance of a perpetual transmigration of bodies, even in Minerals, sometimes incrusting and frequently pervading the whole substance of Vegetables

getables and Animals, destroying the original constitution of those vegetables and animals, occupying their places and assuming their figure : Of this, beside the Petrefactions in the above catalogue, the Marbles inclosing petrified shells, and the Pyrites, sometimes in the shape of the *Cornu Ammonis* and other Fossils, are evident instances.

2. The greater part of the Petrifications above enumerated, are of the Calcarious kind, making an ebullition with Acids, and being reducible to Lime, but there are many instances of Petrifications altogether of another kind, viz. which resist the operation both of Acids and of the fire. So the *Lapis Mytilites* & *Ostracites* above mentioned, make no Ebullition with Acids; the last was of an iron colour, and consisted of a considerable portion of iron, burning to a dark red colour, and then yielded greatly to the Magnet, and to these add

Several Flinty bodies, or at least stones, which struck fire with steel, and excited no ebullition with Acids, from our shore, one of which had ramifications as of the spines of some fish, another had the shape of a screw inscribed on it; and to these add our Mill-stones and *Granites*, being Petrifications which also resist both the Fire and Acids. And

It

It may be noted here, that such Petrifications as these would not give way to *Hannibal's* Vinegar, with which he is said to have melted the rocks in his passage over the *Alps*.

3. Many of the Petrifications (D) above mentioned, are found in places where the Water has no influence in forming them, even in places remote from either springs, the river or sea ; and consequently such Petrifications seem rather to have been effected by mineral steams.

4. That which is called a Transmutation of Iron into Copper, in some copper mines, particularly one of ours in the Co. *Wicklow* (but which is no more than a precipitation of the Copper, in the room of the Iron, taken up by the *Menstruum*, from its superior attraction or affinity to the Iron) is a beautiful illustration of the transformation of Vegetables and Animals into Stone, assuming the shape of the Vegetables and Animals, either immersed in Petrifying-waters, or exposed to Mineral steams, impregnated with sparry or other particles, which are precipitated and occupy the place of the petrified bodies.

I shall

(D) Those Petrifications where the *Pyrites* is the most considerable ingredient, are another instance to the same purpose ; and so is our *Lough Neagh* stone, which also resists both Acids and Fire, and lost nothing of its weight when kept seven hours in a red hot crucible, and when kept in the greatest fire that a Wind-furnace could give, for eight hours, which vitrified the crucible, it was not changed.

I shall close this article of Petrifications with an account of a particular kind of them, formed also by Nature, as it may prove a hint of real and important use, and as such it is here offered, having been communicated by Dr. Browne, Author of a *Civil and Natural History of Jamaica*, viz.

“About *Carr's-bay*, in the island of *Mount-ferrat*, where the soil is gravelly, and probably impregnated with Iron-ore (of which an indication appears in a large piece of red Ochre, found in the place) it is remarkable that the flakes or fragments of earth that fall from the precipice into the sea, are soon converted by the salt water into solid Rocks; and I have observed the like Petrifications in *Jamaica*.”

“And *Smith*, in his *History of the Co. Kerry*, p. 401, describes a like Petrification there, viz. At the mouth of the *Shannon*, not far from *Beal-Castle*, is found a Clay, which is soft like Loam, but by the working of the Sea upon it, is petrified to that degree that it becomes harder than the little pebbles which it contains: and the same Author in his *Co. of Cork*, p. 111, mentions a loose, sandy Clay, encroached on by the Sea, at or near *Clay-Castle*, and observes, that the pieces of the bank which break off, and are washed down by the sea, are by degrees petrified into a very hard, firm Grit, as
solid

solid as stone; and he remarks that this Grit is composed of a mixture of fine sand and yellow Loam or Clay, tempered by the Sea-water which beats against the hill.

N. B. The yellowness in the Clay last mentioned, and the red Ochre in the neighbourhood of the Petrification above, in the island of *Mountferrat*, are indications of Iron ore.

From these accounts the Doctor inclines to believe that such Petrifications from the same cause, viz. an Iron Ore and Clay and Sand, blended with Sea-water, may be found also in many other places, and that this species of Petrification very well deserves to be examined, and its nature further enquired into, as we probably might be hereby enabled to find out a composition of the same nature, which might serve as a Cement in Buildings, in and upon the Sea, such as Light-houses, Wharfs, Banks, &c. which require a strong and lasting Cement of this nature; and in support of this he observes, that the recements of a Forge, powdered and mixed with Sea Sand, in Gravel-walks, becomes of a considerable hardness; and to this agrees a method lately communicated from Dr. *Fothergil*, of preserving the bottoms of Ships from being destroyed by Worms, viz. by means of Iron, mixed with Sea Sand, and often moistened with Sea water, which forms

in a short time an impenetrable stoney Incrustation, and perhaps the addition of Clay might be an improvement of the composition for this purpose.

Of Crystals.

CRYSTALS are hard, pellucid and naturally colourless bodies, striking fire with steel, not effervescing with Acids, nor reducible to Lime by the fire as Spars, but many of them vitrifying in a violent degree of heat, tho' *Neuman* observes that they are more difficultly fusible than sand, and require about an equal weight of alkali for the Vitrification.

The *Kerry* stone is of this species of Fossils, and we have several of them in this county, as at *Loughshinny*, where it is called Rock-Crystal, *hexagonal* and of other figures, and at a Lead mine opened at *Castleknoch*, and in a quarry at *Raheny*, hexagonal and octangular in a ploughed field at *Rob's-walls*.

They have been formed into Sleeve-buttons, seals, covers of snuff-boxes, set in rings and buckles, and have been often sold for real Gems; for whereas Crystals, as well as Spars, frequently

ly receive various tinctures from the Metals combined with them, and as the real Gems have frequently the hexangular figure and colour of Crystals, these last are frequently mistaken for them even by jewellers, v. g. the Crystal accidentally tinged with green, is sold under the name of the occidental Emerald (E), and most of the Topazes worn in rings are, according to my author Dr. Hill, of this kind.

(z) The little pains that have hitherto been bestowed on enquiries into the Fossils of this country considered, it is no wonder that very few instances of real Gems found here, should have appeared; however, discoveries even of these, ought not to be despaired of; for *Smith's History of the Co. of Kerry* mentions the Amethyst, and we have good authority for another, in an account published of the *Giant's Causeway*, in the *Philosophical Transactions*, by Dr. Pocock, viz. that among the Stones of the said *Causeway* a certain rough Pebble was found, which when polished, proved to be a white Carnelian.

✶ Since the above was committed to the press, there was shewn me a Fossil brought from a quarry of our black building-stone near *Dunfink*, under the denomination of a *Spar*, to the character of which it in no wise answers, but is of a far superior hardness and brightness, being a thin Incrustation, consisting of minute fleakey bodies, strictly adhering to one another, and to the subjacent Stone, of a bright white, like Silver, but much more glittering, and is used as an ornament in buttons, earrings and snuff-boxes. There is indeed a sparry opaque matter interspersed, but the brilliant parts strike fire plentifully with Steel, emit a sulphureous flame in burning, and leave a dark red powder, so that it appears to be a *Marcasite*, and is accurately described by *Hill*, in his *History of Fossils*, p. 610, under the denomination of *Marcasita argentea*, or Silver-coloured *Marcasite*.

Of Limestone.

I Proceed next to the Limestone, which is defined to be a Stone which by the action of the fire is reduced to powder, and afterwards, being mixed with water, acquires a new cohesion and hardness, and does not strike fire with steel.

It is distinguished from the Sand-stone and Slate, by its close and solid texture, by its having no visible grit, and by its splitting with equal ease in any direction.

It is an article of very extensive use and importance, even to builders, soap-boilers, tanners, skimmers, in agriculture as a manure, and even in medicine.

Dublin is very happily situated in respect to the great plenty of it in its neighbourhood, and consequently the cheap carriage of it.

It supplies a better lime and stronger cement than that in *London* made of chalk, which makes a weaker Lime; and hence our buildings are firmer, and less liable to be injured by fire.

It

It is found on every side of the town on the low lands, even to the extremities of the County, *v. g.*

On the South side

Near *Miltown-bridge*, was formerly one of the best quarries in the county; and more lately

On the Road to *Miltown*

A black Limestone beginning to rot, and impalpable.

Near *Killikee* a rotting one.

Going to *Rathfarnham*, a quarry worn out.

Near *Smith's Mills*, famous for the Building-stone (of which hereafter) is a Quarry.

It abounds on the river-side from *Ringford* up to *Rathfarnham*. *Templeoge*, &c.

On the West side,

A blue Rotten one at *Dolphin's-barn*, in the neighbourhood of the lead mine.

At *Ashtown*, *Shoulder of Mutton*, *Blue-bell*, *Cappock*, *Dunfink* and *Diswel's-town*, are quarries.

In the road to *Lucan*, a quarry of Limestone and Slate.

Between

Between *Lucan* and *Esker*.

On the N. side of the *Liffey*, opposite to *Hermitage*.

Near *Lutterel's-town*, a quarry of Building-stone and Limestone.

Between *Clondalkin* and *Dublin*, quarries.

Near *St. Catherine's*.

At or near *Newcastle* quarries, and N. of *Rathcool*, and from *Rathcool* to *Clondalkin*.

On the road going to *Blesington*, near *Saggard*.

At *Crumlin*, and from thence a Vein of it is extended to *Saggard*.

On the North side

Near upper *Corballis* and *Cloghran-Church*, and at the other *Cloghran*, Northerly, is a quarry of a softer kind, fit for plaistering.

Near *St. Margaret's*, where is a tepid water.

At *Swords*.

At *Chinkwell*.

Near *Portrane*, and near *Rush*.

Near *Argillam*; and

Excellent about *Skerries*.

On the North coast.

At

At *Naul* good, and the very pavement consists of it, and *Oldtown* consists of rocks of it.

Feltrim-hill and *Carrick-hill* are all Limestone.

On the East side

In plenty at *Raheny*.

Near the lower part of the Hill of *Howth*, and on the coast of *Howth*, are quarries.

From *Raheny* to *Baldoyle*, a quarry.

On the coast from *Portmarnock* to *Malahide*, grey rocks of it.

On the shores going to *Dunlary*, *Bullock* and *Mountown*.

At *Kilcragh*, near *Donnabate*, a quarry.

Next, it is worth while to attend to the variety there is in the texture and composition of parts in different Limestones, and in the uses they are proper to be applied to.

The greater number are of the gray sort, the white Sparry sort are not so valuable, for reasons to be hereafter assigned. Some few are chalky.

Several of those at *Raheny*, at *Sutton*, at the Hill of *Howth* and at *Swords*, bear a polish approaching to Marble.

Vice

Vice-Versa, at *Dolphin's-bar*, near the Lead-mine, is a blue rotten Limestone.

We have also in this county a grey Limestone, cap't with flint, and Strata of Flint incorporated with Limestone.

Many of them exfoliate or rot in the air, throwing off scales year after year, and by this means become a good manure.

Some become black, and some ochre-coloured on their rotting, the ~~last~~ seems to be from some contained iron, and this decomposition may be owing to the acid of the air first changing the iron into Vitriol, and then leaving the Ochre, even in the like manner, as the calcarious Nitre is formed upon some Limestones, by the same acid uniting itself to the calcarious matter, this last being the genuine basis of the *Nitrum calcarium*.

N. B. *Newman* shews the presence of the marine-acid in Limestone, both crude and calcined, and it is certain the calcarious earth, thus combined, attracts the moisture of the air.

Some contain the delineations of Cocks, Muscles, Leaves of Trees, Moss, Worms and other things, *v. g.* at *Howth*, at *Crumlin*, and at *Cloughran-Church*, where the Limestone is softer and fitter for burning ; but at *Raheny*, the
Vein

Vein extending from *Cloghran* to *Feltrim*, *Raheny* and *Howth*, is more solid and hard, and fitter for building.

I found a yellowish and almost pellucid one at the *Danish* mount, near *Forest*; and

Near *Corballis*, one whose external coat was grey, the interior part brown and rotten; the external part was calcined to Lime; the interior, applied to the like degree of fire, yielded much to the magnet, so that here is a combination of iron. In another near *St. Margaret's*, wherein there is an intermixture of an ochre-colour, something ferrugineous is betrayed, but in a less degree.

Some of them are bespangled with yellow shining Pyritical bodies, some of which, beside their Sulphur, shew copper by the blue tincture they give to Spirit of Sal Ammoniac.

Some are marked with black spots as from ink, as on the shore of lower *Corballis*, which smelt remarkably sulphureous on collision, and sparkled a little on the red hot iron, the black colour being allowed to be owing to the Phlogiston.

And, as to the position of their strata, there is not less variety with respect to their inclination

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nation

nation to the horizon; some perpendicular, some parallel, others of various intermediate degrees.

And lastly, with respect to the uses of the different sorts, the rotten sort is of use as a Manure, and I have known it to scour Brass well.

The harder sort is fitter for building, *v. g.* that from *Sutton*, approaching to Marble, and makes a stronger Cement, like Terras, and enduring under water as *Gypsum*: the softer and white sparry sort serves for plastering, and for burning for manure, but does not make so strong a Cement as the grey sort generally does (F).

It is also worth considering as an article of Commerce: *Non omnis fert omnia tellus*, is verified in this instance: for *Arklow*, and some parts of the Co. of *Wicklow*, having none of this article, are supplied from *Howth*, and lately by a black sort from the Co. of *Carlow*, one of

(r) So Dr. *Short* remarks that the dark brown, the grey, blackish and jet-black Limestone, tho' difficult and expensive to burn, is seldom used but for building bridges or churches, because it presently turns hard after burning and is of perpetual duration, even more lasting than the stone itself, neither air, time nor weather weakening its cement.

of the best Limestones in the Kingdom: and I am informed that the *Dutch* are so well acquainted with the excellency of our *Irish* Lime, as to have imported it from hence.

I shall conclude with the Analysis of Limestone, which I apprehend will be clearer by first giving that of Spar. (See Spar above.)

1. A semipellucid Spar, collected from the interstices of Limestone, excited a strong ebullition with *Aqua fortis*, and a greater degree of heat than the following, and was entirely dissolved.

2. On two drachms of Limestone from *Crumlin*, was poured about an ounce of *Aqua fortis*, which excited a great ebullition, and dissolved the greatest part of it, leaving only nine grains in one experiment, and six in another undissolved, which was a dark coloured clay-like matter, smelt strong on friction, sparkled on the red hot iron, and left a white earth; so that Limestone appears to be spar, debased by earth or clay, and a mineral inflammable matter,

Reaumur's method of analysing stones, is perhaps more simple, viz. "The basis of many stones is mud, hardened by a petrifying juice; to distinguish these, powder them, and dilute the powder with water, let them subside, and when all is precipitated, the upper layer of what is

O 2

precipitated

precipitated will be found a ductile sediment, which may be kneaded.

OF MARBLES.

THE use of these in tables, chimney-pieces, tomb-stones, and other ornamental works, is well known.

They are a subdivision of Limestone, and defined to be stones forming continued *strata*, bright and beautiful, of very lively colours, and of a constitution so fine, that they will readily take a good polish: they are moderately hard and do not give fire with steel, excite an ebullition with acids, and burn to Lime with a slight fire.

The quantity of Marble in this County is not very considerable, nor is it remarkable, for that variety of colours which adorns those of some other counties.

We

We are not however destitute of it; for among the Limestones at *Howth* and *Raheny*, are some that bear the polish; and at *Kinsealy* is said to be a bed of excellent marble, and at *Loughshinny* a quarry, where some of the Marbles are said to have petrified shells incorporated with them; also Marble is found at *Kilcragh*, near *Donnabate*, on the estate of *Maurice Keating, Esq;* and on a bank east of *Clonskeagh-bridge*; but particularly at the rocks called the *Landing-rocks*, near *Rob's-walls*, on the coast going from *Portmarnock* to *Malahide*, is a large vein of black and some white marble, consisting of huge rocks, like *Kilkenny* marble, and in it are here and there representations of white shells; and *Richard Talbot, Esq;* shewed me a sample of Black Marble, variegated with white, from a large quarry of it at *Malahide*, which takes a fine polish, and is little or not at all inferior to the *Kilkenny* marble.

I observed in the hollow of some of the Rocks above-mentioned, what appeared to me to be the rudiments of such Petrifications, viz. divers shells and small stones, which were so strongly agglutinated to the rocks, that it required a great force to separate them.

As an encouragement to the prosecution of works of this kind, it has been observed, that the lower one goes down, the better the stone.

Of

Of the Lapis Lydius, or Touchstone.

IT is a black stone, even harder than marble, for it strikes fire with steel, which very few of the marbles do, nor does it effervesce with Acids, which all Marbles do; this was found on the river side, going to *Old Bawne*.

It receives the colours of gold, silver, copper, and brass rubbed on it, the gold colour being not destroyed by any thing but *Aqua regia*, whereas the colour of the other metals is instantly destroyed by *Aqua fortis*, so that by this means counterfeit money is detected.

Wormius, in his *Musæum* (c), mentions several sorts of marble used for this very purpose, and *Linnaeus* places *la pierre de Touche*, among the calcarious, and calls it *Marmor rude atrum*; and it has been commonly supposed that any black marble of tolerable hardness will answer the purpose of a Touchstone.

(c) Page 42, 43.

Cæfal-

Cæsalpinus, however affirms, that the *Lapis Lydius* was formerly found only in the river *Tmolus* in *Lydia*, but that now a black and green kind of marble is used for trying gold, silver and brass, by rubbing on it; but *Hill* gives a more minute account of this matter, viz. "The *Basaltus* and *Lapis Lydius antiquorum*, the Touchstone of the antients, or *Giant's Causeway* of *Ireland*, was originally found in columns in *Ethiopia*, and in fragments in the river *Tmolus*, and some other places, and we now have it both in columns and smaller pieces in *Spain*, *Germany* and *Russia*, about *Dresden* in *Silesia* and in *Poland*, but the noblest store in the world seems to be that in *Ireland* (H)."

Now the *Lapis Lydius*, found as above in this county, is altogether distinct from this, for that strikes fire with Steel, which the stone of the *Giant's Causeway* does not. Perhaps that which I have taken the liberty of calling *Lapis Lydius*, found as above, is a species of the *Jasper*, a stone not so hard as flint, nor so readily striking fire, viz. the *Jaspis unicolor atra* (1).

(H) Hist of Fossils.

(1) *Waler. Mineralogie. Tom. 1. p. 184.*

But

But as the Stone of the *Giant's Causeway*, even as a Touchstone, is the peculiar glory of *Ireland*, I shall here adduce some recent observations on its internal constitution: *Hill*, who places it among the Marbles, observes that it ferments the least and the most slightly of all the Marbles in *Aqua fortis*, and is in the least degree dissolved by it, and Dr. *Richard Pocock* (κ) informs us, that it is composed of crystal, spar and very fine black sand, and that it will make glass bottles with kelp, so that it is vitrifiable, and should seem to be entitled to a middle place between Marble and Flint.

It is however agreed to be a fine Touchstone, and its superior excellence as such is acknowledged; on which occasion it may be well worth while to hear *Emanuel de Costa* (L) in his natural History of Fossils, viz. "No Marble or calcarious substance is fit for the trial with *Aqua fortis*, because the Acid will immediately destroy the substance of the stone, and consequently affect and somewhat deface the streaks of the metal; but to have a good Touchstone, one must choose a black stone of the *Basaltes* kind, as our *Giant's Causeway*, or a *Jasper*, on which the *Aqua fortis* will only dissolve the Silver or Copper, &c. without touching the gold or affecting the stone, and for the superior excellency

(κ) *Philos. Trans.* Vol. 48, Part I. p. 228.

(L) Page 264.

excellency of the stone of our *Giant's Causeway*, even in preference to the *Jasper*, it may be worth while to consult the Author here quoted.

Of Slate, and the Building-Stone of *Dublin*, a *Sympexium* or Rock Stone of *Hill*.

THE situation of the city of *Dublin*, with regard to the last of these stones, is not less happy than what it has been observed to be with regard to the Limestone, there being quarries of it on every side of the town, as will appear in the following enumeration, and with it also divers other stones a-kin to it, and of great use in the furniture of our houses and otherwise.

These stones as to their internal constitution, may be ranked as of a middle class, between the *Sympexia* or *Rock Stones* and the *Stegania* of *Hill*, or in more vulgar language between the

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Limestone

Limestone and Slate, having more calcarious matter than the last, and less than the first.

The first, or *Rock-stones*, are defined to be "Stones forming continued strata, of a close, solid, smooth texture, or composed of no visible grit, and generally destitute of brightness, tho' in some degree capable of a polish (M)."

The second, viz. *Slates*, are described to be "Stones of a close, compact texture, of a laminated structure, splitting into plates, which easily vitrify, and do not strike fire with steel."

Our Building stone and Limestone are frequently found in the same quarry, as are likewise the Limestone and Slatey Stones; and many of our Building stones (tho' not of the best sort) are flakey, moulderling into laminæ, or scales in the air, and do not burn into Lime.

These stones then, occupying a middle place, between the Limestone and Slate, and an account of the Limestone having been already given, it seems not to be out of method to premise some account of the state of the *Slates* and *Slatey Stones* of this county. As to the *Lapis Hibernicus* or *Irish slate*, as it is chiefly to be considered as a Vitriolic ore, it shall suffice here to

(M) See Hill, and Emanuel de Costa's Hist. of Fossils, and Walerius.

to refer to the account above given of it as such (being, as to its internal constitution, entirely different from other stones of the same general denomination) and to give a transient view of the *Slates* and *slatey* Rocks in this county, whether of any, or no value, for the purpose of covering Houses, as Tiles.

On the mountains S. and S. W. of *Rathfarnham*, Slates are the prevailing stone, and it is said that the whole tract, extending from thence to *Blesington*, is chiefly slatey; and even at *Rathcool* their Firestone Chimney-pieces are not supplied from their own neighbourhood, but from that of *Blesington*, and on the mountains S. W. of *Rathcool*, slatey rocks are the most remarkable, and in a mountain near that town is a quarry of slate, but not wrought, being not very good, from all which appears the absurdity of appropriating the appellation of *Mountain-stone* to our *Firestone* or *Granite*, (of which hereafter.)

On *Barneslingan-hill*, is a heavy Slate, and not so fissile as that from *Blesington*, yet capable of being split, and for want of better, some cover their houses with it. At *Friarstown* some Slates are brought from the mountains adjacent.

At *Ballyman* is a red slate, which on calcination turns redder, and is then a little attracted

tracted by the Magnet; and in our journey to *Bullock* and *Dalkey* were found bad slates: Near *O'Farrel* are said to be better, and capable of splitting and serving the purpose of tiles in covering houses.

On the South side of the hill of *Howth*, is a bad slate, too heavy for that purpose. At *Ireland's-Eye* is a red and grey Slaty Stone, and beyond *Portrane*, viz. on the shore opposite to *Ireland's-Eye*, are grey and red slaty rocks.

Between *Palmerstown* and *Hermitage* is a quarry of a black Slaty Stone.

Thus it appears that there are few or no good Slates yet discovered in the county, the goodness of which, viz. for the purpose of covering houses is proved: 1 ft by the found: 2 dly by weighing and soaking six or eight hours in water, and if it weighs heavier, it will not long endure without rotting the laths or timber (N).

What answers this character, being the *Ardesia vulgaris*, *Lapis fissilis*, *durus*, *cærulefcens*, *clangofus* *Ardesia tegularis* *Walerii* *Mineralogie*, is
supplied

(N) *Eman. de Costa's Nat. Hist. of Fossils.*

supplied to us from *Wales*, and what makes the nearest approach to it is brought from the neighbourhood of *Dunlavin* and *Blesington* in the Co. *Wicklow*: and the best are said to be found at *Dowding's town* on the borders of the Co. *Dublin* (o) and *Kildare*. (p)

Rag-stones merit a place here, viz. by reason of their affinity to *Slate*, being placed among the *Lapides Schisti* by *Emanuel de Costa*, being a useful stone, viz. for giving a smooth edge to iron tools after being ground on rougher stones. We are supplied with this stone from *Wales*, but it seems not improbable that further searches might discover as good here. For these stones abound on the shore of the river *Doder*, particularly from *Old Bawn* to *Castle-kelly*, being a glossy stone, consisting of straight striæ, mostly grey, rarely of a dusky red, and often appear as if cut off like a chip of wood, being the *Schistus viridi cinereus* of *Emanuel de Costa*, and some few on this shore are found upon tryal to be good for sharpening knives and Shoemakers awls.

They

(o) *Linneus* gives an excellent hint concerning the origin of the *lapides schisti*, viz. *Ex humo palustri originem ducere lapidem schistum suadent vegetabilia quæ huic sæpius incluse reperiuntur.*

(p) It is a great mistake in the Natural and Civil History of the Co. of *Waterford*, that *Rag-stones* were called black Building-stone in *Dublin*, as will abundantly appear in the sequel.

They are also found scattered in other places, as at *Tarah-hill* near the Paper-mills, and near *Ballynascoreney*: and a bluish and fleaky one was found in our walk to *Dunfink*, and

At *Stag's-town* in the parish of *Rathfarnham*, a brown one, like petrified wood.

Of the Building-Stone of the Co. Dublin.

I Return now to give some account of our *Building-stone*, and others agreeing to it in their internal fabric, in which there is a considerable variety with respect to colour, hardness and solidity: they are generally darker coloured than the Limestone, containing more phlogistic and less calcarious matter, and for this reason make less ebullition with Acids than the Limestone; and their *strata* in different quarries differ greatly with regard to their position to the horizon, as will appear in the following enumeration.

On the E. side of the city near *Stephen's green*, is a quarry which (A. D. 1763) has been opened
twelve

twelve years, and has enriched its proprietor, consisting of a grey stone like that of *Curfis-stream*, (of which hereafter) being the *Saxum durissimum ceruleum* of *Emanuel de Costa*. (Q)

The strata are almost parallel to the horizon.

Here are also Flags and Hearth-stones, and under the above named is a layer of Limestone.

At *Cabragh* were found two quarries of a grey sort.

N. B. As the present enquiry has been of some years standing, some of the quarries once opened will not now be found.

At *Glassnevin* a quarry of the black sort, somewhat resembling that at *Curfis-stream*; the strata were perpendicular to the horizon: the stone made but little ebullition with spirit of Vitriol.

Near *Finglas* bridge two quarries, the position of the strata whereof was nearly perpendicular to the horizon.

Near *Finglas*, and E. from it, a good black sort, some of the layers of which were eighteen inches thick, and in an inclined position of about 45 degrees. The worse sort mouldered in scales.

At

(Q) Nat. Hist. of Fossils.

At *Curdaff* bridge, a quarry of this and of Limestone, where the position of the strata is horizontal.

Near *Clonee*, a quarry of a black fort, and all along *Tullagheen* river to *Admiral Rowley's*.

Near *Arlane*, a quarry formerly wrought, of a bluish and somewhat flakey stone : it made some ebullition with spirit of Vitriol ; but not so much as Limestone, nor did it burn to lime.

Beyond *Coolack*, another flakey stone, more rotten, and which made a stronger ebullition with spirit of Vitriol, and smelt sulphureous on collision.

At *Field's town*, a quarry of *Flag-stones*, which may be reckoned a subdivision of this stone, often splitting into *laminæ*, and making an ebullition with *Aqua-fortis*.

At *Forest* and *Stradbally* are *Flag-stones*.

About *Knocksedan* a quarry of hard stones in large pieces, some of six or eight feet long, four broad and two thick, and a grey one there not so good, but subject to be rotten.

At *Kilfoghan*, a small quarry of a hard, blue fort, which made no ebullition with spirit of Vitriol, nor burnt to Lime.

At

At *Ward*, a quarry of good stone, tho' a little flatey, it made but a little ebullition with spirit of Vitriol, and did not burn to Lime.

Near *Brazeel*, and near *Rathbeale*, quarries of the black sort: at *Brazeel* a quarry of a greyish blue, and some of the stones large; one was a foot deep, two feet broad and seven feet long.

At *Chapel-midway* a small quarry of the like stone.

At *Graliagh* another.

On the lands of *Mullahoo* another quarry: some of these stones are rotten, others sound, but both excited an ebullition with Spirit of Vitriol, and in so doing emitted a fetid smell, residing in, and thus manifesting the phlogistic (not to say sulphureous) matter disengaged from the calcarious earth dissolved by the acid.

At *Swords* a quarry of this stone. And the like frequency of quarries of this stone is observable on every side of the city, *v. g.*

At *Crumlin*, a grey sort, in plenty.

At *Dolphin's-barn*, a blackish sort, and supplies Hearth-stones, Flags and Head-stones: it is not affected by Spirit of Vitriol, so strongly as the Limestone of *Crumlin*, nor reducible to lime. The strata dip at an angle of 45 degrees.

At *Madden's*, opposite to *Clondalkin*, a fine quarry of black Flag-stones.

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Q

At

At *Lutterel's-town*, a quarry of Building-stone and Lime-stone.

Near *Palmerstown*, a quarry of a firmer sort than that at *Curfis stream*, being less scaley, and having stood good in the great house at *Palmerstown* eighty years.

At *Lucan* two quarries of a good sort.

At *Blue-Bell* several quarries of a grey sort, and extended here and there to *Clondalkin*.

At *Dunfink*, a blue and flakey sort: it made but little ebullition with Spirit of Vitriol.

But the most noted quarry in the county is of a dark grey, or black sort of stone, tho' not much used for building, except of Walls at *Curfis-stream*: some parts of it are slatey, but these are rejected. It is wrought into beautiful Chimney pieces, smooth, and not inferior to Marble, except a little in gloss and hardness. It excites an ebullition with Spirit of Vitriol, but less than Limestone. Kept ten hours in the fire, lost its black colour, but did not slacken with water, nor acquire the taste of lime. Some odd pieces carry a natural polish on their surface, like Coal or Jet.

It also supplies black Flags for flooring, Hearth-stones, Stones for Piers, Head-stones and Tomb-stones: All these effervesce with *Aqua-fortis*.

fortis diluted, but less than Limestone, all which are smoothened on the spot with *Wicklow* sand and water. One of these stones has stood 100 years in *Michan's Church, Dublin*, without scaling.

Some of these stones have Spars and Crystals adhering to them in their interstices, as in Limestone; and some the small brass-coloured pyritical bodies interspersed upon them here and there, which last is a mark of their being more sulphureous, and known and pronounced as such even by the workmen, and some have the *Micæ argentæ* interspersed, all evidences of the sparry, crystalline, sulphureous and sometimes micaceous matter entering into the composition of this stone.

At *Smith's Mills*, situate on *Stubbin's* land by the river *Doder*, about half a mile to the S. W. of the city, is a very antient quarry, of a hard, black and as it were flinty kind of Building-stone, and described by *Hill* under the denomination of *Sympexium filiceum*. This has less sparry matter than the common Building-stone, being less affected by Acids, is deemed the hardest of any in the Co. of *Dublin*, being so hard as to strike fire with steel, harder than many Marbles, and acquiring an additional hardness by the weather; and the old Spire of *St. Patrick's* in *Dublin* is said to have been built of it. It is not a Marble, for it does not admit of a polish, but only of being smoothened by sand. Its hardness is so

great that when long exposed it can scarcely be cut at all, which is one discouragement to its use. On the contrary, the stones of several of the quarries near it, soon moulder into scales with the weather, and should be used only for inside work. This has not always been attended to by the overseers of our public Edifices, where we frequently see these last mouldering in a few years; however, partly from their easiness to be cut, and partly by the situation of some of these stones nearer at hand, and consequently the cheapness of carriage, they are used in preference to the other more solid and durable stone, even in those parts of the building which are most exposed to the weather: but such persons build for themselves and not for posterity.

To the like purposes it may not be useless here to subjoin a useful document with regard to the distinct and respective use of different stones in building. At the *Red Cow* near *Dublin*. where are quarries of these stones, the Workmen, in their language, distinguish one sort of stone by the name of *Waller's* or *Waller*; and I found upon trial that these were such as consisted more of a flinty than a calcareous matter, that they struck fire with steel and made no ebullition with Acids, such stones bearing the weather, and therefore being fit for building of Walls where they last long, quite otherwise than the flakey sort, and even than ordinary Lime-
stone,

stone, both which moulder in the air, and are rather fit for the insides of buildings where they are not exposed to the air.

This stone, on its ebullition with Spirit of Vitriol, sinks for the reason given.

This quarry also supplies Head-stones, Tomb-stones, Hearth-stones and Flags, and the steps going up to *Paul's Church London*, are said to be made of these last. The four last named stones do all make an ebullition with Spirit of Vitriol, but less than Limestone, nor are they reducible to lime by calcination: they acquire a degree of polish by rubbing with *Wicklow sand* and water, on the spot, as those of *Currys-stream*.

There is also a black sort of the Building-stone on the N. of the *Doder* at *Mill-town*: and in one of the walls adjacent to the quarry there frequently occurs a stone which is flinty in the centre, concreted to a calcarious matter surrounding it. The like occurs at *Crumlin*.

Lastly, in travelling to the E. one meets with frequent quarries of this stone, *v. g.* near the gallows beyond *Stephen's-green*, a dark grey sort and very good, and by reason of its situation near the town, very profitable to the proprietor.

At *Clontarf*, a quarry of a bluish sort, scaling in the air, but not much: and on the road going to *Killester* were those formerly called the *Black quarries*,

quarries, by reason of the blackness of the stone. Some of the stones of the last named quarries are almost as hard as flint (and so like those above of *Smith's Mills*) and some strata of them have a bed of black Flint in their centre, of half an inch thick, the upper and under stratum of the same stone being the matter of the common Building-stone.

In the same quarry were also found Flag-stones, often split into *laminæ* or scales, which are affected by Acids, but less than the common Building-stone.

On the strand near *Booter's-town* is a grey sort: and on the S. side of the Hill of *Howth* this stone is found in great plenty, and of a good sort, altho' neglected.

I shall conclude with

The

The Comparative Analysis of Limestone, Building

One Drachm of	1. Spar femipellucid	o o
	2. White Marble	Nearly so.
	3. Chalk	o o
	4. <i>Crumlin</i> Limestone,	Gr. III. and strong on being iron, the rest a
	5. Dark grey Building-stone at <i>Dolphin's-barn</i>	Gr. XII or colouring the fire on the red hot
	6. Dark grey Building-stone of <i>Smith's Mills</i>	Gr. IV is, a which rubbed be sparkled on the
	7. Common Building-stone from <i>Killester</i>	Gr. XVII. hot iron, more III. on being left was in form
	8. Flinty Building-stone from <i>Killester</i>	Gr. XXXI, the fingers but but gr. I. kept changed to a lig
	9. Flag-stone from <i>Killester</i>	Gr. XXXIV smutted the fire in the red hot an hour in iron an eye of red
	10. <i>Curfis-stream</i> , blue-grey stone, having shining spangles on it	Gr. XI or smelling a gr <i>Aqua fortis</i> w the red hot, it were d b

In *Aqua-fortis* left undissolved

O B S E R V A T I O N S.

1. **S**PAR, white Marble and Chalk are entirely dissolved in Spirit of Nitre, and some of our purest Limestone leaves but about one fifteenth part undissolved ; but the Building-stone and Flags leave a greater proportion undissolved, and some of them leave about one half undissolved.

2. Whereas Spar, white Marble and Chalk, appear to be purely calcarious, the other stones do evidently betray a combination of a Phlogistic or Bituminous matter, as appears from the dark colour, strong smell and sparkling of the residuum left untouched by the *Aqua fortis*.

3. If it be queried what is the matter in the above-named stones dissolved by Spirit of Nitre, the answer is easy, that it is the calcarious earth, but not the phlogistic matter, for this is left behind, as appears by the colour, smell, and some degree of inflammability of the *residuum* left untouched by the acid, as likewise are the shining particles, and those that yield to the magnet ; and indeed the Phlogistic or Bituminous

Bituminous matter bears but a small proportion to the rest, as appears by the small loss in weight, which the residuum left untouched by the acid sustains in the fire.

And from hence it further appears that the great loss in weight, which Limestone and Chaff suffer on calcination, viz. one half or more of their weight, must be owing to some other principle than the meer Phlogistic, because this does not subsist in quantity enough in these bodies to account for this loss, and therefore that it is rather owing to the Air contained in them, and manifested both by their ebullition with Acids, and by the dissipation of it by the fire, according to Dr. Hales's account of this matter.

4. Limestone is pronounced by the gravest Authors to be an eminently sulphureous matter, but upon a careful examination, it appears that Sulphur is not an essential ingredient in this stone: for pure white Marble and Spar which are pure calcarious stones, are entirely dissolved in Spirit of Nitre, and leave nothing behind, and the *Crumlin* Limestone leaves but very little, whereas the other more deeply coloured stones leave a phlogistic or bituminous matter untouched by the Acid, and indeed in a much greater proportion than ordinary Limestone. I was confirmed in this opinion by the testimony

testimony of an experienced operator in the quarries at *Curfis-stream*, viz. that the stones there are more Brassy, i. e. contain more Munday or Pyrites, and smell more strongly sulphureous than Limestone, of which there is but very little in those quarries.

Of Flints, and other Stones, a-kin to them.

HAVING so far considered the Stones, which are more or less calcinable by the fire, or dissoluble by Acids, the transition will be easy to such as are not calcineable by the fire, and but little or not at all affected by Acids : among which the most remarkable are,

1st, Flints, being of great use, not only in striking fire, but making Glass and other compositions, particularly those made in imitation of precious stones, v. g. the artificial *Topaz*, is made of white flints powdered, and of two or three parts of calx of lead fused together, and the artificial *Emerald* of two ounces of white

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R

Glass

Glass or Crystal, and ten grains of the scales of copper (R). Also Flints have been sometimes polished for Sleeve-buttons.

But besides this, Flints are a considerable article of commerce, for it is said that (s) there is not a Flint to be found in all *India*, but that vast quantities are exported thither from *England* and other parts of *Europe*, which how far used in the manufacture of the *China* ware, may deserve enquiry; and in the mean time the following use of Flints in our neighbourhood seems to be worthy of attention, viz. in the manufactory of a certain *Staffordshire*-ware, sometimes called *Boslam-ware*, from a place of that name in that County, which bears the fire much better than the *Delft* ware, and in some circumstances is said to bear boiling water as well or better than *China*. It is made of Flints powdered and Tobacco-pipe clay, which is glazed by the fumes of salt thrown into the Glass-house fire, when of the most intense heat, salt being of great use in promoting the fusion and vitrification of the Clay.

(R) As we are yet strangers to the cutting of Flints, the DUBLIN SOCIETY has offered a premium for it, and in some measure introduced it here.

(s) *Salmon's Modern History*.

It

It is to be observed that the hardest of Flints are cut with water and sand, but not by an iron instrument; for the saw which is made use of with the sand and water is not toothed, so that it only serves to apply the sand to the stone. (r)

Flint in its utmost simplicity is thus defined. "A semipellucid stone composed of Crystal debased by a peculiar and appropriated earth, of a blackish grey, of one similar and equal substance, and [free from veins, by which it is distinguished from the Pebble] and naturally invested with a whitish crust, (u) to which add, from the same author, that it makes not the least effervescence with *Aqua-fortis*, either in its own matter, or in the whitish crust, having no sparry or calcareous matter combined.

The word Flint however has been used in a far greater latitude, both by ancients and moderns; for *Pliny* mentions both red and white Flints, and some stones of this denomination are reducible to Lime by calcination, (w) and in *France*, a calcineable sort is found, which is used not for building Walls, but whitening them, (x) and such are the *Silices preparati* in *Bates's* Dis-

R 2

pensatory,

(r) *Cæspines de Metallicis.*

(u) *Hill's Hist. of Fossils.*

(w) *Wormii Musæum.*

(x) *Rieger Introd. ad. notit. rer. nat.*

penfatory, and accordingly *Linnaeus* mentions the *Silex cretaceus*.

The last named Author and *Walerius* distinguish between the *Quartzum* and the *Silex*, altho' it is common to both to strike fire with steel, to break glassy, and to fuze in the fire ; but *Walerius* mentions some of the *Quartzum*'s, of which not above $\frac{1}{20}$ or $\frac{1}{30}$ is dissolved in acids, (y) whereas *Agates* and *La pierre a fusil* (common Flints) according to the same author, are dissolved to above half in highly concentrated acids, a probable indication of the admixture of some sparry matter.

Flints, properly so called, according to the above Definition, are not unfrequent on our shores and elsewhere, being black and shining within, and covered with a white crust. I also found some on *Ring's-end* shore with reddish and yellowish coats, the nucleus whereof was yellow, and struck fire with steel as well as or better than the grey sort. The colours in these last proceed meerly from some slight metalline tinge, and therefore they do not appear to be essentially different from the common Flint.

2. But beside these, there are also other bodies, which may be properly denominated flinty, tho' not perfectly agreeing to the definitions given us either

(y) P. 200. Tom. I.

either of the *Silex* or *Quartzum*, both which last break glassy, and have a degree of transparency, which these have not: these are frequently found on our shores and on our mountains: they seem to be a crystalline matter further debased by some foreign mixture than common Flint, and are of one simple colour without veins or variegations, whereby they are distinguished from Pebbles: they strike fire, and excite no ebullition with Spirit of Vitriol, *v. g.*

A white and almost pellucid one is frequent on *Bray* shore, which struck fire but weakly, being according to *Hill's* doctrine, an imperfect crystal, or a crystalline matter hindered from shooting in a regular figure by the admixture of a white earth.

Others are white and opaque, *v. g.* on the shore of lower *Corballis*, I found one that was white, brittle and gritty, but struck fire with steel strongly and smelt sulphureous; and another which altho' it scraped chalky, still struck fire, and did not acquire the taste of lime by calcination, countenancing *Walerius's* conjecture, that Flints by time suffer a decomposition, the white crust according to him being formed by the operation of the air and heat of the sun, whereby at length it is turned into a white earth or clay.

Of the like kind we also find in some places stones variously tinged, as brown, yellow, red
and

and black, in different degrees, varieties proceeding from the different proportions of the metalline tincture.

3. A third species of bodies, akin to Flints, may be reckoned *Pebbles*, being (z) “ stones composed of crystalline matter considerably debased by earths, and those of various kinds in the same species, (whereby they are distinguished from Flint) and thence subject to veins, clouds and other variegations, usually formed by incrustation round a central nucleus (whereby they are distinguished from *Agates*) altho’ sometimes the effect is of one single concretion like the *Agates*, and which indeed are the *English Agates*, answering in every particular but fineness to that gem.”

Our shores, particularly from *Loughlinstown* to *Bray*, abound with *Pebbles* of all colours, and often beautifully variegated, so that they might contend with the *Egyptian*. They all strike fire with steel and cause no ebullition with Acids.

They bear the polish, and serve for making the tops of snuff-boxes, seals, heads of canes, sleeve-buttons and handles of knives.

(z) *Hill's History of Fossils*.

The

The Porphyry,

SHALL next be considered, being a stone of some considerable use and importance, as it may properly serve Painters and Apothecaries for Slabs and Mortars to grind their colours, and to levigate their testaceous and metal-line powders on, and particularly for rubbing or blending any thing that contains an Acid, for which Marble mortars are utterly improper, to which add that (A) many of the noblest ornaments of antient *Rome* were of Porphyry; and tho' it be tedious and expensive in the working from its great hardness, yet its beauty, strength and high polish would make it worth the pains.

One of the stones from the rocks hereafter mentioned is said to have been used as a Mill-stone for grinding the Materials used for glazing the Delft-ware at a Manufactory near this city.

It will therefore be no useless labour to investigate and distinguish the stone that shall be found to have a right to this appellation.

Woodward gives to some of the Porphyries the title of Marble, but we are now by the labours of
Hill

(A) *Hill's History of Fossils.*

Hill and his Successor *Emanuel de Costa*, and *Linnaeus*, enabled to speak on these subjects with a greater degree of precision; the Porphyry being much harder than Marble, and neither calcineable by the fire nor dissoluble in Acids, and it is thus defined (B) "A stone of a plain, uniform mass, spotted with separate concretions, of great hardness, giving fire with steel, and very slowly and difficultly calcining in a strong fire."

Emanuel de Costa remarks, as to the hardness, that in this respect it exceeds all other stones of strata to him known, and that it must be work'd by Emery in the lapidary way, entirely resisting the instruments of steel on the mason's work.

The last named author affirms that most of the *English* coasts abound with Porphyries and Granites; and the *Porphyrites durissimus carneus nigro viridi & albo variegatus*, No. 3. 497, is said to be frequent in *Ireland*, (c)

Now we find in several places, even in the neighbourhood of *Dublin*, stones which very nearly correspond to the above characters of Porphyry; particularly on the hill of *Howth* are large rocks, white and red, shining like marble, and to a superficial view appearing like white and red Marble, bearing a natural polish (as the red one did an artificial) but much harder than Marble, for this stone cut an iron pebble when struck

(B) *Hill's Hist. of Fossils.*

(C) *Ibid.*

struck on it, nor did it bear the Saw: it struck fire copiously with steel, and smelt sulphureous on collision.

It made only a just sensible ebullition with Oil of Vitriol, scarce any with Spirit of Salt or *Aqua fortis*.

Kept ten hours in a pipe-maker's furnace, it was not softened, but harder, and still struck fire with steel.

On *Ireland's-eye* are found more rocks of the same kind of stone, having a natural polish, breaking opaque and purple, and of several colours, and when kept ten hours in a reverberatory furnace, it was still hard, altho' more brittle, but still struck fire with steel.

Of the Granite, vulgarly called Firestone.

THE latter of these appellations seems to have been given to this stone from its first use in hearths, ovens and chimney-pieces, where it bears the fire better than many other stones, being not apt to split, as our *Cursis-stream* stone above-mentioned does, but as this stone is altogether distinct from the *Pyrites*, which is also englished Firestone (as *Grew* calls his *Pyrites aureus* a gold-coloured *Firestone*) this being a metallic body, whereas ours is rather a crystalline grit debased by earth, and cemented with a talcous or micaceous matter, the denomination of *Firestone* ought not to be retained, but that of *Granite*, of which it is a species, as appears from the following definition.

(A) The *Granites* are stones composed of separate and very large concretions rudely compacted together, giving fire with steel, not fermenting with Acids, and slowly and imper-
fectly

(A) *Hill's Hist. of Fossils.*

fectly calcineable in a large fire (b). Now our Firestone agrees almost in every particular (except in bearing a polish which our does not, save in its shining from the great quantity of Talc with which some of these abound) to the *Granita alba durissima nigro variegata, quæ incolis Cornubiensibus*, Moore-stone of the same Author, who affirms that a strict Analysis and examination of these stones, shew them to be a mixture of pure Talc, true Crystal, and an Earth not unlike the white Boles or Pipe-clay; and he says that it is found in immense strata in some parts of *Ireland*, but is disregarded there and never brought into use; but this with divers other improvements, within these thirty years, is introduced and greatly used and esteemed in our buildings in the city of *Dublin*, (in the neighbourhood of which it abounds, even in almost all the mountains to the (c) South extending to the neighbouring counties of *Wicklow* and *Wexford*,) inasmuch as to have in some measure supplanted the use of *Portland-*

S 2

stone;

(b) *Tournefort*, in his voyage to the *Levant*, calls the *Granite* a white or greyish Marble, naturally petrified together with small pieces of Talc; and that almost all the islands in the *Archipelago* are covered with this *Granite*.

(c) Near *Dunlary* and *Bullock* some of these stones have been found, which bear a polish (being cut with *Emery*) but not a beautiful one; they are building their Piers at *Dunlary* with it.

stone; for tho' it is not capable of being cut into the finer figures of architecture as that, yet it may be cut into any shape, and bears the weather better.

It is cut at the quarry (where it is softer, but hardens in the air) into all shapes by the chizzel, mallet and hammer (like the Freestone, than which it is harder) as into Window-jambes, stools of Windows, lintens and jambes of Doors, pillars, troughs, mortars and chimney-pieces. The Spire of the present Steeple of *St. Patrick*, in *Dublin*, is built of it, and part of *Effex-bridge*, and the Piers of *Wicklow*, and at *Dunleary*.

It makes no ebullition with *Aqua fortis*, containing no sparry matter, but a crystalline grit debased by earth.

It strikes fire with steel.

I kept a fragment of this stone which was hard, weighing 240 grains, in a red hot coal fire in a kitchen three hours: it lost only two grains in weight, and still struck fire with steel, but was become brittle.

There is a considerable variety in these stones in point of colour (being mostly white or grey, tho'

tho' some are reddish) hardness, brittleness and proportion of talcous matter combined. Of the rotten sort called Freestone, see above.

It differs from the *Portland* stone in this, that the granulae of this last, being sparry, it makes a great effervescence with *Aqua fortis*, and is almost entirely dissolved by it, (D) and will not strike fire with steel, so that our *Granite* or *Firestone* is much harder, and more powerfully resists the action of acids, air and fire. The *Portland* stone abounds with spar, but has little or no talcous or micaceous matter, whereas our *Granite* has no spar, but a debased crystal, and plenty of a talcous or micaceous matter.

(D) *Hill* and *Em. de Costa's* Nat. Hist. of Fossils.

Of

Of Millstones.

THESE demand a distinct consideration from the foregoing stones; those which occurred to me in this county were for the most part red, and contained some portion of ferrugineous matter, being altogether distinct from the *Saxum arenarium*, *Lapis Molaris dictum Cos molaris* of *Walerius*, which has Spar combined, and sometimes effervesces with acids, which ours does not, or but little. A specimen of ours found on the shore between *Raheny* and *Malahide*, being powdered, fled to the magnet swiftly, and is one of the *Lithozugia* or *Pudding-stones* (E) in *Hill's History of Fossils*, p. 557, who says it is used in some parts of *England* for cutting into snuff-boxes and other such toys, and indeed some of these are naturally polished.

And in a glyn called *Millstone-glyn*, between *Rathfarnham* and *Carrickmayne*, is a stone like the preceding, being a petrification of gravel, Iron-stone, &c. Of this one ounce, two drachms and

(E) In *Cronstedt's System of Mineralogy*, it is called *Saxum Silicibus amorphis materia Jaspidea conglutinatis*, *Anglice Plumb-Pudding-stone*.

and fifty grains, kept eleven hours in a naked coal-fire, lost scarce one grain, but still retained its hardness and struck fire with steel.

On *Ireland's-eye*, and on the road between *Newcastle* and *Rathcool*, is a red stone of the like kind.

On the lands of *Donnabate*, are large rocks called Millstones, consisting of pebbles and flint cemented together, of various colours, red and pale, and which struck fire with steel, and made no ebullition with spirit of Vitriol.

N. B. *Thomas Covey*, an ingenious Architect, has made some remarks on some of these stones in the Co. of *Wexford*, which I shall insert in his own Words. "They poole or cleave these rocks with wedges, and bring them to the form of Millstones, with picks and pick-hammers, (for no chizze! will cut them) and they are very sound and grind corn clean and well; and I have known good walls to have been built of this stone; for they dress tolerably well with the hammer, and bind hard in their mortar."

Having before given some account of Iron Ore, because of its affinity to Ochre, I shall now proceed to those of Lead and Copper.

I. ft. Of Lead Ore.

IN a Manuscript in the College Library, is the following Paragraph: "In the City of *Dublin*, between *New-row* and *New-street*, as you go to *Roper's-vest*, within 60 yards of the river, is a Lead mine, poor in Silver, but yielding one Ounce of Lead from three of the Ore, as *John Powel*, a Minor, found: upon a trial of it, made at the request of *Sir George Hamilton*." This and the observations we made in our perambulations, joined to authentic accounts we received, shews that Lead Ore abounds both in the neighbourhood of the city and in several other parts of the County, and that the Ore in many places is rich in silver, and produced more Lead than the above-mentioned Lead mine, which appears by several trials made by skilful persons in proper furnaces, and even by some trials made by an *apparatus* of my own, though far less perfect than what is used by those conversant in these matters, *v. g.*

Lead Ore has been found at the Quarry near *Stephen's-green*, on the road to the *Black-rock*, being on the East side of the city, and at old *Jones's Quarry* at *Dolphin's-barn*, being the West side,

side, half an Ounce whereof being fluxed with equal parts of Potashes, gave a drachm and a half of pure Lead.

This Quarry was formerly wrought upon and a smelting furnace was erected in the neighbourhood.

And at another Quarry adjoining the Commons of *Kilmainham*, called *Fleming's Quarry*, higher up the road than *Jones's Quarry*, there were raised in the years 1767 and 1768, in the space of about eighteen months, sixty or seventy tons of Lead Ore, which yielded about twelve hundred of Lead from each Ton of Ore, and about twenty-four Ounces of silver from each ton of Lead: the workmen wrought here to the depth of about thirty yards, but as the Ore raised at this depth came too dear, on account of the great expence of keeping the work free of water, it was dropped. — There are two or three veins of Lead Ore in the Quarry, all of them seeming to take their course into the said Commons; upon one of these veins in the Commons, some Miners in the year 1769 were at work, and raised upwards of ten Tons of Ore, which they disposed of, when washed, to those who smelt it, and the workmen made good wages; they found it within three feet of the surface of the Ground, and did not work deeper than about 28 feet

on account of the obstruction by water. It is supposed that the Ore they then raised, would produce the same quantity of Lead and Silver as the Ore raised in *Fleming's Quarry* above. One of these Veins seems to take its course across the road to *Andrew's* house, near the wall of the court of the said house, where the Ore has appeared, and probably takes its course towards the mountains.

I am informed that unless Lead will produce thirteen Ounces of silver in the Ton of Lead, it won't bear the cost of refining, the loss of Lead being from two to three hundred weight in the Operation. Lead Ore has been also found at *Kilmairtham*, being probably a continuation of the same vein from *Dolphin's-barn*. And in the Deer-park near *Castleknoch*, there was found Lead Ore and Copper Ore, and also near the old Castle of *Castleknoch* and North East from it, there was a Lead mine opened in the year 1744, by *Edward Ford, Esq;* and on some of the stones were green spots, indicating a mixture of Copper. Likewise at or near *Dubber*, and at *Dunfink*, is found both Lead and Copper Ore, and some very rich Ore at *Cloghran's Church*, where two Mines were formerly wrought upon, but the work was dropped.

Near

Near *Rob's-walls*, in the Rocks, Lead Ore is seen disposed in ramifications, and Crystals resembling *Kerry stones* are found there, which is an encouragement to make a search there. Also Lead Ore is found on the hill of *Howth*, and a vein of it on the shore about midway between Lord *Howth's* house and the Lighthouse.

On the North strand, almost opposite to an old Quarry near *Clontarf Town*, are two or three veins of Lead Ore, one whereof, at the distance of about 80 yards from the shore, was wrought upon in the year 1768 by some Miners, who raised there upwards of 14 Tons of Ore, which afforded them good wages. On the surface appeared a kind of yellowish Ochre, they would not sink deeper than about 30 feet, nor could they make large openings, as their Pits were filled every Tide with the Sea water, which they were obliged to pump and lade out, so that they could not work at raising the Ore more than two or three hours every Tide; this Ore produced, when smelted, about twelve hundred of Lead in each Ton of Ore, and some Silver was found in the Lead upon assaying it; but not worth refining.

A Lead Course near *Crab-Lough*, was formerly wrought upon by Capt. *Vernon*, whose estate it was, but he desisted working it, as it did not answer his expectations.

I am informed that on the estate of Lord *Fitzwilliam*, under Lady *Arbella Denny's* Garden, a Vein of Lead Ore hath lately been observed of some inches thick, by *Patrick Hyland*, Miner.

Near *Dalkey* is a Lead mine, where it is said that some hundred Tons of Ore have been raised. I got 42 grains of Lead from 90 grains of it, fluxed with equal parts of Salt of Tartar.

In *Killeny Bay*, on the Estate of *John Malpas, Esq;* a work was begun in the year 1751; the Ore was said to be rich, and to contain a considerable quantity of silver.

On the demesnes of *St. Catharine's*, a Lead Vein was discovered and formerly wrought upon for a short time by the owner, *Sir Samuel Cooke*.

Upon some Lands belonging to the City of *Dublin*, near *Hunt's Town*, and adjoining to the publick Road, leading from *Dublin* to *Ratoath*, by the way of *Cardiff's-bridge*, there appears a Lead vein which has not yet been wrought upon, tho' it seems to give a promising prospect.

Lead

Lead Ore is of singular use for making the black glazing of pots, which alone are used for Pickles, not suffering the vinegar to transude as it does thro' other Glazings; that is made by mixing the Powder of the Ore and fluxing with *Manganese*.

Lead, when refined for silver and reduced into Litharge, is used in making of window and flint glass, as a great promoter of Vittrification, which is also used for glazing of Pottery-ware.

The greatest Proportion of Silver I have heard to be obtained from Lead in this Kingdom, is 80 Ounces in a Ton, from a certain Lead Ore near *Silvermines*, in the Co. *Tipperrary*.

2. Copper Ore

OCCURS not unfrequently in this County, but tho' some attempts have been made in raising it, nothing of moment hitherto has been done.

Near

Near the river, about a mile West from *Knockmaroon-hill*, is a vein of Copper ore.

At or near *Dubber* is a yellow, green and shining Copper Ore.

Near *Cloghran Church*, a Marcasite of Copper and Lead mixed.

Near said Church a whitish stone intermixed with green spots: it yielded a deep blue Tincture to Spirit of Sal Ammoniac.

Crystals, some of which have green spots interspersed (an indication of Copper) were found near what they call the *Diamond Rock* (being a collection of Crystals, at *Loughshinny*, where *Benedict Arthur* of *Seafield, Esq;* raised some Copper Ore, but dropt it, the Vein, tho' sometimes affording large lumps, proving thready and small.

In a quarry of Limestones and building stones, the property of *Hamilton Gorges, Esq;* at *Rathbeal*, Copper Ore was found in the form of a crystalline stone, variegated with green, yellow and brown colours, speedily imparting a blue tincture to Spirit of Sal Ammoniac.

In the parish of *Castleknoch*, near *Diswellstown-house*, on the estate of *Thomas Kennan, Esq;* Copper Ore was found mixed with Spar, and which

which appeared to be rich, but after sinking some yards the work was dropt; and on the same estate in a quarry, there appeared a Copper-course, which was wrought upon for a few months, but the Ore raised there did not defray the expence, and as the course seemed to lead into the estate of *Simon Luttrell, Esq;* which was nearly adjoining to it, and the undertaker had no Mining Lease, the work was dropped.

It may be worth noting that the volatile Alkali, viz. Spirit of Sal Ammoniac, never fails to discover Copper, tho' blended with Sulphur or other Minerals, by the blue Tincture it receives from the Ore.

Of

OF THE

MINERAL WATERS

in this County.

HAVING in a former treatise given a minute account of divers Chalybeate and purging Waters in this County, I shall not attempt to enlarge this work by a repetition of what has been already published; but as something new has occurred since the above publication, especially with regard to the Purging Waters of *Dublin*, and one Sulphureous lately discovered in this County, in a not inconsiderable series of practical observations, with a diligent attention to the real effects of these waters, I take this opportunity of communicating them to the public.

VOL. II.

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But first of the Petrifying Waters.

A few recent instances of which having lately occurred within the compass of this county, I thought it were an injury to the public to suppress the mention of them, and the rather, as it is more than probable that these Waters are far more frequent than is commonly imagined, and withal worthy of particular attention, the more because their uses are but little known tho' probably very considerable. In this small county and within a very few miles of the city, several other springs of this sort have occurred to my observation since the year 1757, as First, On the brow of a hill, in a Limestone soil, in the territories of *Luke Quin*, Gardener, near *Chapel-izod*, in the year 1758, was discovered a spring of this kind, over the current of which were large white Petrifications of the stumps of trees, from the subtile calcarious particles conveyed in the form of vapour, and intimately insinuating themselves into the pores of the wood.

A second was lately found on a declivity on the E. side of *Chapel-izod*, near the town, and a third at the *Black-mills* near *Hermitage*, on the North side of the *Liffey*.

I should

I should choofe, with Dr. Hill, rather to affix the appellation of *Sparry* than of *Petrifying*, to these waters, because the last named term seems to have carried with it a strong, tho' very unjust prejudice against the medicinal use of these waters, since it is certain from numerous observations made on them, that they are not only very wholesome, being used as common drink, but even really serviceable in the cure of the Gravel, *v. g.* besides several other instances, that of *Carolsbadt* in *Germany*, tho' so strongly impregnated with a calcarious matter, that it would choak up the pipes and channels, if not cleared four or five times in a year, is yet much frequented and drank in cases of the stone and gravel (A), and Dr. Hill ingeniously accounts for their good effects in these cases by a probable conjecture, that the calcarious particles of these waters unite with the fabulous matter, and carry it off by urine.

I shall therefore communicate a few Experiments which I made on the first named of these Springs, tending to shew its real and distinguishing contents, with hints on the practical uses of these and other like waters.

It was observable of the first of these Waters, that neither *Aqua fortis* nor Spirit of Vitriol ex-

U 2

cited

(A) Philos. Transact. Vol. L. Part I.

cited any ebullition with it at the fountain; but when it had been three hours taken up, as also when brought to *Dublin*, (a distance of two miles) they both caused a sensible rising of minute bubbles, an appearance analogous to what is observed in divers of the Chalybeate waters in relation to the purple colour struck by Galls, which is much deeper on the Waters standing a little while than in that which is taken immediately from the fountain, the dissolving subtil volatile Acid in some measure flying off, as Dr. *Lucas* justly remarks, and so the ferrugineous particles in such waters, as in the present case, the calcareous, uniting into larger *molecules*, these, become more susceptible of an ebullition by the effusion of a foreign Acid, as the others are of a deeper tincture from Galls; from which experiments we see that in these waters taken from their fountains, there soon commences a *derangement* in the impregnating particles, and that it is of considerable importance whether a water be taken at the fountain or at a distance from it.

I ordinarily boiled this water in a clean tin-pot for my Tea during the space of six weeks, at the end of which, I examined the crust it had deposited on the sides of the vessel; it was white, and $\frac{1}{16}$ of an inch thick, impalpable, and about double the quantity of Crust that our Pipe-water of *Dublin* yielded in the same space of time; also it was more dusty and less tenacious than the Crust yielded by the Pipe-water: it whitened the fingers

fingers like chalk, and whitened water a little. It frothed prodigiously with Spirit of Vitriol and with *Aqua-fortis*, and was dissolved in the latter, only leaving about half a grain from ten grains undissolved. It turned slowly green with Syrup of Violets; and thus in all experiments it answers to *Lac Lunæ*.

On half a drachm of this white Crust I poured *Aqua-fortis*, until it would dissolve no more, and there was left of a dark-brown powder, weighing, after being washed and dried, scarce one grain, which on the red hot iron emitted a white flame of a smell somewhat suffocating.

Thus it appears that what Decoction separates from this water consists chiefly of a calcarious earth, with a small proportion of an inflammable matter, which last was further manifested by precipitation from the water at the fountain thus :

Eighty drops of the Solution of Silver added to a pint of the water precipitated a white and blackish powder, and left a small quantity of a purple-coloured matter strongly adhering to the sides of a Delft mug, and which sparkled on the red hot iron.

In a second Experiment, eighty drops of the same Solution, poured into a quart of the water, gave a small quantity of a blue powder, which
being

being dried, sparkled, flamed and melted very strong on the red hot iron. In two other trials the Precipitate emitted a white flame on the red hot iron, but when the iron was less hot, it burnt blue.

The last method of Analysis I used, was by evaporation to dryness in a sand-heat, by which means I obtained from a gallon, 22 grains of a grey matter, of a slightly saline and bitterish taste, consisting of the calcarious earth, a bituminous or inflammable matter and the saline, all blended together; it shall suffice to say that the saline was evidently of the alkaline kind.

From these experiments it is evident that in this, as in other waters of the same kind, the predominating principle is the Calcarious Earth, tho' far less abundant than in some other of these waters, and not without a mixture of the inflammable Principle, the mineral Oil or Sulphur, or both.

I had no opportunity of observing the effects of this water, save that it was wholesome used in Tea and common drink, and that it was of service in a certain flatulent Cholic, in one, and in a dysenteric disorder, in another; but as the waters of the same kind commonly called Petrifying, but more properly Sparry or Calcarious,

Calcarious, have been really observed to produce good effects, in cases of the stone and gravel, where the stone is not too big to pass; I would recommend the trial of these and other waters in the kingdom, of the same kind in these cases, and likewise as a Lotion in other cases, with proper Advice.

It has been observed by *Lister* long ago (and which is since abundantly confirmed by later Experiments) that the Waters in which the calcarious earth predominated over the saline, were astringent; and to this agree other Observations from Experience, of the efficacy of the Petrifying Springs in *England*, in the cure of inveterate fluxes of the belly and hæmorrhages, even in man or beast; and therefore these waters in this county and others like them elsewhere, are now recommended to the notice of the Physicians of this kingdom.

OF

Of the Water of *Patrick's-Well*, at *Finglafs*.

ABOUT fourteen years ago, a stone Arch was built over this well, on account of some signal Cure it had performed, and since that time it has been resorted to, sometimes more, and sometimes less, but especially in the summer 1768, where it undoubtedly produced some notable good effects in the cure of divers stubborn impetiginous disorders, sore eyes, and inveterate and ill-conditioned Ulcers, some of which had resisted Mercury variously administered, as Dr. *Wall* observes of the Waters of *Malverne*, in *Worcestershire*. The patients usually kept wet rags dipt in the water applied to the parts frequently thro' the day, and drank the water on the spot to several quarts in the day, at the fountain.

This water scarce manifested any thing singular to my taste, except some little roughness; but two persons who lately accompanied me to the spot, affirmed that it had the taste of dead Spaw water; and it is to be noted that this trial was made at a time when the well had been lately cleaned, and the Water had not

not stagnated in its basin; and this account may admit of a confirmation by the following examination of it, with regard to the evidences of an admixture of an ochreous matter.

This water does not instantly lather, but curdle with Soap for some time before it lathers, but upon standing and depositing some of its contents it becomes soft, and draws an agreeable infusion from Tea, (even as Rain-water at its first falling is hard, but softens by standing) the subtil solvent acid flying off and leaving the terrestrial matter to subside.

The appearances with Alcalis, with Acids and with Lime-water in the following Table, shew a calcarious earth in small quantity, as in other Calcarious waters, but the Solution of Alum shews this more strongly, even as it precipitates the Calx from Lime water.

The greenness acquired by Galls, on standing two or three days, and the dilute green from Syrup of Violets, are also appearances common to this, and the calcarious waters; but to demonstrate this more clearly, recourse must be had to the Analysis both natural and artificial.

well attested of it, I doubt not but a series of time and observations, may furnish instances of equally happy success in the use of this water, in order to obtain the full benefit whereof, recourse must be had to the fountain.

The Table annexed, will exhibit the several appearances more clearly, in one view.

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OBSERVATIONS.

1. **T**HE *Malverne* water is one of the most simple waters that hath yet been examined, yet not without some impregnation by a Mineral Oil, and withal is possessed of great Virtues.

2. *Patrick's* water, by the appearances with the three Metallic solutions in the Table, shews also the presence of a Mineral Oil, tho' less than in the *Malverne* water; but to compensate for this defect, it has a considerable proportion of calcarious Earth united to an ochreous matter, and by the experiment with the Solution of Mercury in *Aqua-fortis*, shews more of the universal Acid.

3. *Patrick's* water, however, appears by the Experiments with the three Metallic solutions, to contain more mineral Oil than either Rain-water or our soft Pipe-water.

4. The quantity of solid contents in *Patrick's* water being chiefly calcarious Earth, are above double to those of Rain-water, and almost double to those of Pipe-water, and above
double

double to those of the calcarious water of *Mount-Prospect*; they exceed those of *Mallow* water, but are less than those of *Bristol* water; this however gives it an advantage over the other waters, which are less impregnated with this principle, to which the absorbent and healing qualities of these waters are attributed.

O F

OF THE
PURGING WATERS.

AS the Purging waters of *Dublin* are of great use and importance, and equal to any imported, I shall here annex some further observations made concerning them since the publication of my Essay on the mineral waters of *Ireland*; and first, the following is an Account of the variation in the contents of the several Waters there mentioned, and of two others discovered since, being the result of an examination made of them every summer, during a series of twelve years.

CON-

CONTENTS IN A GALLON.

A. D.	Byrn's Arms	Pump	Plough	Wheat Sheaf	Vernon	Wild	Craig
1758	Gr. 96	353	224	244	265		
1759	138	345	321	221	231		
1760	185	{ 484	{ 310	299	{ 256		
		{ 377	{ 320		{ 192	384	
1761	160	248	266	336	272	266	264
1762	150	397	295	326	176	{ 318 353 379	300
1763	168	448	312	182	232	280	320
1764	184	400	120	168	180	160	304
1765	288	608	248	847	304	256	544
1766	256	530	216	315	296	286	512
1767	256	312	192	320	236	1832	576
1768	206	338	204	224	338		420
						$\frac{2}{xv.}$ 1769	552
1770	200	302	248	288	312	213	364

N. B. On the upper *Coombe*, at *Edw. White's*, is a Water which A. D. 1770, gave 284 grains of solid Contents.

Thus it appears that these waters have undergone some considerable variations in the respective quantities of their contents, inasmuch that whereas the *Byrn's-Arms*, which in my former Examen used to yield the largest quantity, has since yielded the least, tho' in the later years

years it is gaining ; but the *Pump* has ~~always~~ yielded the greatest quantity ; but *Wild's* water has in the last trial failed in its contents, for what reason I know not. *for y*

I did not find the contents to vary with the weather, or to be lessened, except on a long series of wet weather.

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Ap.

Appearances with two newly-discovered Purgine Waters of DUBLIN.

I. CRAIG'S Water in Hanover-lane.

Alkali's	Acids.	Solution of Silver	Solution of Merc. sublim. cor.	Milk	Flesh	Syr. of Violets	Galls	Logwood	Cale	Lime-water	Solution of Alum.
A white grumous Sediment	An ebullition, tho' not great	A white and bluish Sediment	Scummed and green, but soon vanishing	A clear whey	Mutton and Beef boiled red	A slight green	Whyeish, then greenish	Red, fading to yellowish	Green, but tough	A small white grumous Sediment	A white grumous Sediment

II. WILD'S Water, at the Golden Key and Stutty.

A small white grumous Sediment	Some ebullition.	A large white grumous Sediment, much more than Alkali's, and which acquires a dark bluish colour on standing.	A pellucid, but almost coagulated with P. of Milk.	No curd when boiled.	Beef red.	A greenish calf.	Green near the Surface.	Deep red.	Deep green, but hard.	A slight incrustation.	A white grumous Sediment.
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The two Waters in this Table, viz. *Wild's* and *Craig's* are of recent discovery, and therefore I shall subjoin some account of each of them, both as to the nature of their contents and their operation and effects.

The first was discovered by *John Wild*, near the upper part of the N. Side of *Francis-street*, in the year 1760. It is an old well newly opened, being built with stone in a regular manner, and rises at 35 feet below the surface of the ground.

It is a clear water, sparkles in the glass, is in taste a little bitterish and saline, but very mild in both these qualities. Three pints ordinarily gave about four stools, and it must sometimes be quickened with some of the purging salts.

This water does not curdle Milk when boiled with equal parts of each, otherwise than most of the other waters in the neighbourhood, and indeed than most purging waters which generally curdle Milk, an argument of a Salt approaching to the *Sal Glauberi verus*, which does not curdle Milk, and of an impregnation like that of *Cheltenham*, *Alford* in *Somersetshire*, and that of the *Dog* and *Duck* near *London*, neither of which curdle Milk; nor indeed does an equal proportion of the Salt obtained from this

Y 2

water

water curdle Milk, as the Salt obtained from most purging waters does. Add to this, that the residuum of this water being rubbed with Sal Ammoniac, smells stronger than the residuum of any of the neighbouring Springs rubbed with the same salt. Also there is but very little yellowness in the cloud exhibited by the Solution of Mercury in *Aqua-fortis*, even far less than with most of the other Waters in this street, an evidence of a less quantity of the vitriolic acid. These Experiments shew a greater tendency to Alkali than what obtains in the *residua* of most of the purging waters in the neighbourhood.

Nevertheless, it is observable that the *residuum* of this water does not moisten in the air, as that of most of the purging waters in the neighbourhood, but keeps dry, as indeed the pure native Alkali does, as does also the *Sal Glauberi verus*, whose basis is an Alkali, and therefore the moistening in the air, whatever it may be of the artificial, is no essential mark of an alkaline Salt in a water, since the *residuum* of the following Water which has less marks of an Alkali, moistens much in the air.

But, altho' this water be impregnated with a Salt, which approaches nearer to an Alkali, than that of most of the neighbouring waters,
yet

yet it falls short of the alkaline quality of *Aix-la-chapelle* and other sulphureous waters, impregnated with the native Alkali in that, altho' it reddens Beef, and turns Cale green, yet it does not render either of them more tender, as the waters impregnated with the native Alkali do; neither does the *residuum* of this water turn red or yellow with the (A) Solution of Sublimate; also the Solution of the Salt grumifies with the Solution of potashes, (as does also each of the seven waters with Oil of tartar) so that it is far from being a pure Alkali; but it gives stiff, white and bluish grumes with solution of Silver, and the *residuum* rubbed with Oil of Vitriol, excites a strong ebullition and an acid smell, like that of Spirit of Salt, the plain characters of marine Salt, which the Crystallization of the Salt abundantly confirms: for, upon making divers solutions in triple and sextuple the quantity of distilled waters, most of the crystals approached to a cubical figure, interspersed with a few of the oblong kind.

And, that the predominant Salt in these waters is truly marine, and entirely distinct in kind from the predominant Salt in *Lucan* water, is abundantly confirmed by the following Experiment.

(A) In a subsequent Experiment there was some yellowness.

The

The Salt obtained from the water of the *Pump* being added to a depurated *Aqua-fortis*, dissolved leaf gold, and so did the Deliquium in the air of the *residuum* of Craig's water entirely, whereas the Salt obtained from *Lucan* water, added to the same *Aqua-fortis*, left the gold untouched, its Salt being chiefly alkaline with only a small proportion of marine Salt; whereas the other, being chiefly marine Salt added to *Aqua-fortis*, makes an *Aqua-regia* dissolving gold.

And moreover, to confirm the justness of the Analysis of these waters above given, it is evident, that as Sea water contains two sorts of salts, the muriatic so properly called, and a bitter Salt, so do these waters; for, after the separation of the muriatic Salt by its imbibing the moisture of the air and melting, distilled water being poured on the remainder, acquires the nauseous bitter taste, and when Oil of Tartar is added to this Solution, it precipitates a white grume like the *Magnesia*, formed also by adding an Alkali either to the Bittern of Sea water, or to the Solution of that called *Epsom* salt, the alkali uniting itself to the vitriolic acid, leaving the white terrestrial matter to subside.

The indissoluble matter in *Wild's* Water, left in the filtre, of which it yielded about a fifth
or

or a sixth part, after having made an ebullition with *Aqua-fortis*, leaves an eighth or a sixth part of black matter undissolved, which washed and dried, was inflammable, being the mineral Oil thus demonstrated, in concurrence with the evidences of it from the appearances mentioned in the preceding Table, with solution of Silver and solution of Sublimate.

Upon the whole, from this detail compared to the experiments in the Table, it is evident that the Salt impregnating this water is chiefly marine, combined with a little of the *Sal catharticum amarum* and enveloped with an absorbent earth, and a little mineral Oil.

And moreover, the above Experiments may further afford a practical hint, viz. that as the Salt of *Wild's* water borders less upon an Acid than most other purging waters, it may be preferable in cases of a redundant Acid, and the *Sal-polychrest* and the *Tartarum vitriolatum*, whose basis is an Alkali, may be more congruously used as Stimulants added to this water than the common *Epsom* or *Glauber's* Salt.

And here it seems to be of use, to take particular notice of one of these Waters situated more Northerly and near the last described, viz. that of the *Wheat-sheaf* in the same Street, even on account of its bordering more upon the
the

the Alkali than any of the preceding Waters, excepting the last described, called *Wild's*; a circumstance entitling it to some peculiar notice in practice, tho' the Water has been for some time less regarded.

First then, this Water added to Spirit of Vitriol in equal quantities, had an evidently greater effect than any of the other Waters except *Wild's*, in destroying its acidity, which may be owing to two causes; 1st, to its containing a greater quantity of calcarious Earth, 2^{dly}, to the alkaline quality of its Salt evidenced by its dismissing the volatile alkali from Sal Ammoniac, in a more pungent smell than the Salt of any of the rest do, except *Wild's*; Again, tho' the *Wheat-sheaf* water curdles Milk, it is with a more turbid whey, whilst the others give a clear whey. And it makes a greater ebullition with Spirit of Vitriol than any of the rest. And it tinges Syrup of Violets of a deeper green than most of the others.

Of

Of CRAIG'S Water.

THIS is situated at the S. E. of the other Purging Springs in the neighbourhood, having been discovered in 1761, in *Hanover-lane*, where its taste was so strongly bitter and saline as to have given suspicion of its being artificial, but the Experiments in the Table above and the following Observations, shew that its Salt is really like that of most of the purging springs in *Francis-street*; its residuum particularly obtained by evaporation, is so strongly attractive of the moisture of the Air, that it is hardly possible to obtain it dry; pitch does not more readily melt at the fire than this imbibes the moisture of the air; it far exceeds marine Salt in this property, and yet borders more upon an Acid, than the Salt of the foregoing, *viz. Wild's*, as appears not only from its curdling Milk, but the residuum of this water rubbed with Sal Ammoniac smelt only a little pungent, even far less than that of *Wild's* water; and it leaves in the filtre a less proportion of terrestrial matter, and consequently is a smarter purge, so that I have known a pint to have given four or five stools, tho' it is ordinarily requisite to increase the dose to a quart or more.

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A. D.

A. D. 1767, I made a more minute Analysis of this Water thus:

Dr. vii. of the Residuum, left upon evaporation, were exposed to the air many days, in order to obtain the lixivium of its Salt by means of the moisture of the air, for which purpose it was exposed as long as it continued to grow moist in the air. On being thus exposed it left only Dr. iii. gr. xv. of a dry brown powder.

On this dry brown powder, distilled water was repeatedly poured, infused, boiled and decanted, and became nauseously bitter, to which Oil of Tarter per deliquium added, precipitated a white powder, which made a strong ebullition with Spirit of Vitriol. It effervesced also with Oil of Vitriol, but emitted no visible fume with it, resembling the *Magnesia-alba*, precipitated from the Bittern of Sea water by the same Alkali, and that it is a real *Magnesia* appears from hence, that, having been washed in distilled water and dried, it was kept half an hour in a red hot crucible, but it did not acquire the taste of Lime nor redden with the Solution of Sublimate.

The remainder left undissolved, after those repeated affusions and precipitations, amounted only to 17 grains of a dark brown powder, which made very little ebullition with Spirit of Vitriol, which seems to be some portion of
a mi-

a mineral Oil blended with a Talc^y or, laxly speaking, a Selenitical Matter. It emitted a fulphureous smell on Spirit of Vitriol being poured on it,

Thus it appears that the chief active principles in this water are marine Salt, and the Sal catharticum amarum, even as in Sea water and the Brine Springs (B).

DUBLIN, 17th ^{XI}XIV. 67.

I shall conclude with an account of the Success of the Use of these Waters in some of the many Cases which fell mostly under my own Observations, and first,

(A) To the above saline principles, viz. the marine Salt and the Bittern, we should, according to *Lewis*, add a third which he calls *Sal muriaticus calcarius*, even that Salt which melts in the air as do the Solutions of Chalk and of calcined Oyster-shells in Spirit of Salt when exhale^d to a dryness as much as possible, and which have the same Brine-like taste as the deliquated Salt of this and the other *Francis-street* waters; and indeed to me it seems probable that this deliquating Salt is formed in the process, the Spirit of Salt uniting itself to the calcareous earth, which is present in these waters, and so forming a Salt like that in the medicine called the *Liquid-shell*, which is a combination of a calcareous earth with the marine acid,

In Disorders of the first Passages.

1765. **A** Woman aged 50, had for a year
Aug. 6. past an *Ardor Ventriculi*, abusively
 called the Heartburn, with a nausea, an utter
 loss of appetite, and a discharge of salt lymph
 by vomiting, as well as of what food she could
 take, which was only liquid. She took a quart
 of one of these waters, in which half an ounce
 of *Sal Glauberi* was dissolved every other day,
 which usually gave her four stools, and was
 relieved by a few doses.

1765. *August 17.* A man aged 40, subject to
 pains in the bowels in summer, during the
 space of eight weeks past had been troubled al-
 so with an ardor ventriculi, with an acidity,
 his tongue sometimes white, and sometimes ex-
 coriated: He took a quart of *Craig's* water
 three mornings successively, from whence he
 had usually four stools, with an alleviation of
 his complaints.

October 7, 1762. A Girl aged eleven, weakly,
 pale and emaciated, rejected her food, had a
 copious

copious discharge of saliva, a bilious vomiting, and an *Ardor Ventriculi*.

I ordered half a drachm of *Magnesia alba* in four ounces of *Wild's* water, night and morning, and that she should take the Water for ordinary drink when thirsty. It purged her moderately, and she was perfectly recovered in three weeks.

1763. May 13. A woman aged 40, for the space of two months had an indigestion manifested by an acute pain of the Stomach after meals, and afterwards a vomiting of phlegm, and an acid water with costiveness and flatulence.

She drank a quart of *Wild's* water aromatized with ginger, four mornings successively, and tho' it had no operation by stool, she grew much better.

1766, August 9. A man aged 34, subject to a porraceous vomiting, which now returned on him with a diarrhæa (which was at this time the reigning disease) attended with thirst, vertigo and anxiety.

In regard to the diarrhæa which attended him, he took one of our Waters in small doses, viz. half a pint in the morning, and half a pint in the evening, for a week; the first days

days it greatly encreased his purging, afterwards but little, and his Vomiting ceased.

1763, *August*. A man deeply hypochondriacal, and infested with vain terrors and palpitation of the heart on the least emotion of mind, and withal costive, was greatly relieved by the *Pilula gummosæ*, and *Wild's* water, taken to a quart in a day, with half an ounce of *Sal-Glauberi* repeated every other day for three times, and tho' it purged him one day twelve or thirteen times, yet no dejection, but a greater vigour of spirits ensued, one instance among others, of the good effects of this and other purging waters in lowness of Spirits, where this proceeds from a load in the *primæ viæ*, as it often does.

1763, *September* 20. A Woman aged 35, after a flow Fever did not recover her Appetite, was thirsty, with a bitter taste, and costive; she also had a palpitation of the heart from motion and cold sweats.

She first took Cream of Tartar with some relief, then four doses of *Craig's* water to two quarts at a time aromatized with ginger, but it did not pass until she drank warm ale, which answered the end, and she was greatly relieved.

A. D. 1765. A man aged 38, whose Stomach had been greatly weakened by spirituous liquors,

liquors, had an indigestion and vertigo, was greatly relieved by a few doses of *Craig's* water, in a pint of which a drachm of *Sal polychrest* was dissolved.

N. B. I have known both *Craig's* water and another of our *Francis-street* waters to have expelled the Tape-worm.

But altho' this and the above instances may suffice to shew the good effects of our waters in disorders of the *primæ viæ*, nevertheless as it were not acting up to the character of an impartial Historian to suppress other instances which appeared similar to the above, in which these waters have failed of giving any relief; I shall give one instance among a few others, to this purpose, viz.

A poor woman, from trouble became hysterical and cachectic, lost her appetite and sleep, was thirsty and costive. She took a quart of *Wild's* water three times, but it chilled her, had no operation by stool, and gave her pain, whether she took it with *Sal Glauberi* and Ginger, or not.

The foregoing Histories however are a sufficient indication of their good effects in diseases of the *primæ viæ*; but that their happy influence is also extended to the remoter stages of the circulation, appears not only from their
good

good effects in the Gravel, attended with returns of the nephritic Colic, but from the following histories of their good success in cutaneous Eruptions and Ulcers.

April, 1762. A middle-aged man, besides eruptions of the skin, had several symptoms proper to the genuine Scurvy, particularly the lateritious sediment in his urine, and a great numbness in his hands and legs, nor could he bear the purging Salts.

I ordered a quart of *Craig's* water with an ounce of Manna, to be repeated twice a week for a month, by which he was purged without inconvenience, and the Numbness was considerably abated; and this may serve as an instance of the preference due to the natural purging waters, before the purging artificial Salts, as being not only much more diluted, but their acrimony also tempered by the absorbent earth and some share of a mineral Oil combined with the Salts; and moreover, upon a comparison between the *Aqua florium omnium* and this water in the same subject, this last did not produce thirst, nor leave a costiveness behind it as the other did: And the following instance concurs in giving honour to this divine composition of the purging Salts in preference to the artificial, viz.

Sep-

September 16, 1765. A Boy aged 17, had for a week past a frightful eruption, ending in a thick yellow crust, covering his chin and jaws with heat and swelling of the neighbouring parts.

He was very difficultly purged, for two ounces of Glauber's Salt had no effect on him.

He was bled, and took only one ounce of that Salt in a quart of *Craig's* water, which purged him well, and in eight days the Crust almost vanished.

March, 1763. A cutaneous disorder like an inveterate Itch and attended with heat, and which used to return every spring and summer, was cured by drinking a quart of the whey made of equal parts of *Craig's* water and milk boiled together, sometimes every day for many months, which purged very gently, and this disorder did not return in the year 1764.

May, 1763. A woman, aged 30, had red pimples on the arms and breast, with a tense skin, heat of the palms of the hand and thirst. She took a quart of *Wild's* water, with two drachms of *Sal Glauberi* every day, for three times, and then every other day for three times, which gave her about three stools each day, and she was cured.

A middle-aged man, had for a long series of time been troubled with a most obstinate and troublesome itching of the skin, and sometimes small white tubercles, like those from the stinging of nettles, as in the *Effere Arabum*; and withal he had likewise for a long time been accustomed to reject his food by Vomit.

He was entirely cured by drinking these waters, for some time as an alterative, taking a quart in the morning and a quart in the evening, which purged him but little.

A. D. 1766. A middle-aged Woman, had eruptions of a purple hue on her face, arms and legs, and a bad appetite.

She drank a quart of *Craig's* water daily for two months, and was cured, and her appetite restored.

A. D. 1766. A middle-aged man, troubled with an inveterate cutaneous disorder, attended with a most troublesome itching, took of *Craig's* water three pints in a day, sometimes with, sometimes without Glauber's Salt, and continued it afterwards with some intermissions for several years, with a notable alleviation of the symptoms; and in the year 1769, the Itching entirely ceased.

April

April, 1766. A man aged thirty, had for five weeks been troubled with pustules on the legs, attended with itching, and a lymphatic discharge.

He took an ounce of Glauber's Salt in a quart of *Craig's* water every other day, and was cured by six doses.

April, A. D. 1768. A Virgin aged 25, long subject to cutaneous eruptions, but lately for two months with that species called *Tetters*, attended with an enormous itching and a watery discharge.

Bleeding having been premised, she took a quart of *Craig's* water, with two drachms of Glauber's Salt, which purged her smartly; then she took the water alone without any purgative operation, and persisting in the use of it, sometimes alone, sometimes with the Salt, sometimes daily, sometimes every other day, during the space of four months, was perfectly cured.

June 3, 1768. A young man, aged 22, had been troubled the last three Springs with superficial Ulcers on the inside of his legs, attended with heat and itching, which continued last Spring for the space of two months, and now since five days are returned.

I ordered a quart of *Craig's* water, with half an ounce of Glauber's Salt, to be taken every morning.

June 6. The discharge was increased: I ordered him to take the same medicine every other day, which usually gave him five or six stools.

June 13. He was better.

June 20 and 28. The heat and itching are vanished, and the Ulcers are dried, so that his disorder, by means of the above process, was removed in half the time that it had lasted the spring preceding.

November 16, 1769. A Woman, aged 28, had for three weeks been troubled with small Ulcers in the feet, with a purulent discharge, and a great itching there and over her whole body.

I ordered her to take a quart of *Craig's* water with half an ounce of Glauber's Salt, for three mornings, which she did, and afterwards in a greater quantity.

November, 26. The Ulcers were cicatrized, but still some humour and itching remained, together with a whiteness and dryness on the tongue: Wherefore she was bled, and repeated
the

the water with the salt every other day three times, and recovered.

April 1, 1769. A man aged 28, had been formerly troubled with rheumatic pains, which were succeeded by small boils on his left leg, ending in superficial Ulcers, with a purulent discharge during the space of three weeks.

I ordered two drachms of Glauber's salt in a quart of *Craig's* water every other day, whence he had each day four or five stools.

April 13. The Ulcers appear to be cicatrizing.

April 28. They broke out a-fresh. I ordered the water with the Salt to be repeated.

May 15. A new eruption of pustules appeared with itching, but no ulceration.

I ordered him to be bled, and a cataplasm of Oatmeal and Buttermilk to be applied, and a Whey made of the same Water and Milk, to be taken twice in a week.

June 2. The Whey was repeated.

June 22. He is recovered.

O B-

O B S E R V A T I O N S.

THUS have I faithfully communicated to the public a more minute account than in my General History of the mineral Waters of *Ireland*, from further observations of the good effects of our Waters in diseases of the primæ viæ, and in cutaneous disorders and Ulcers; and it seems to be worth while farther to confirm the truth of these accounts by those given us from other Observations, made in different parts of *England*, on divers of their waters, impregnated with the like Minerals as ours.

The first is from Dr. *Willis*, who affirms that he has known several Impetiginous disorders exasperated by *Bath* waters, where the Purging Waters have had good effects; and Dr. *Bevis*'s account of the lately-discovered purging Waters of *Bagnigge* near *London*, which upon an exact comparison are impregnated with the like Salts as ours, agrees very well with the effects of ours, as described in the foregoing Histories, viz. that it is excellent in scorbutic and hypochondriac habits, which do not bear the common Purges, that it has been of great advantage in habitual Vomiting and Costiveness, in
cutaneous

cutaneous cases and the Leprosy, attended with itching and inward heat; and where the internal use of the Sea water had been ineffectual, being used sometimes as a purge, sometimes as an alterative, and that it is particularly excellent in the *Herpes*; and moreover some good effects have been produced by it in occult Cancers, drank so as to keep the belly just open.

And this will admit of a further confirmation from the accounts lately published, of a certain strongly impregnated saline water, even one which had more marine salt and less of the *Nitrum calcarium* than ours, viz. of its powerful effects in inveterate cutaneous eruptions, some of which had a leprous appearance, and in the cure of Ulcers, one of which was of a very corrosive kind, affecting the bones, and another attended with a cough, hectic and loss of flesh.

I shall conclude my account of the Virtues of these Waters, with a hint for recommending them as a palliative Medicine in Cancers, as it will be acknowledged to be a laudable attempt to lessen the miseries and alleviate the pains of these unhappy patients, tho' a radical cure cannot be effected by any medicine yet known.

Several Hints have already been published of the good effects of these Waters and of others
of

of a similar impregnation, such as that of the *Dog and Duck*, and of *Bagnigge-Waiers* near *London* in this Case, which I beg leave to confirm by the two following short Histories.

1. *February, 1762.* A child five years old, had a hard tumor with pain and pimples in the under-lip for three months. A Cataplasm of Parsnip was applied and half a pint of *Craig's* water was taken for several days, and three quarters of a pint afterwards for 17 days, and the tumour was softer.

2. A man aged 51, had a Cancer in his lip, which had been extirpated by the knife sixteen years before, but it returned again, and was destroyed by caustic, and now threatens him again in another part of the same lip.

He took a quart of *Wild's* water, with half an ounce of *Sal Glauberi* as a mild purge, and sometimes as an alterative in a lesser dose, as to a pint morning and evening, for the space of four months, and the lip was easier and more free from pain.

Having thus far considered our Purging Waters in a medicinal view, it may not be inconsistent with the general design of this Work to consider them also in a political light, that is, as an article of Commerce.

Now

Now it is to be noted of the Purging Waters that they differ from the common Chalybeate ones in this particular, that they bear carriage and retain their virtues at a distance from their fountains; and in behalf of our Purging Waters in *Dublin*, it may be truly affirmed, upon an accurate Comparison, that with respect to the saline impregnation, (which gives them their purging quality,) they are strongly saturated, and much more so than most of those we import, and not inferior in Virtues: for which reason they might be conveyed to remote places, and even transported to advantage, in which case they would be looked upon as foreign Waters, and might have a chance of being esteemed as such, tho' despised as home.

And whilst I am upon this Topic, it may not be impertinent to consider the vast sums yearly expended, on the importation of the *German* Spaw-waters, and whether or no we might not be in some measure supplied at home at a much less expence.

It is true the *German* Spaw-waters have one excellence, that they do bear carriage better than any of our common Chalybeates, and indeed than any of the common Chalybeates of *England*, and other parts of Europe.

At the same time it ought to be observed, that the Study of the Contents of Mineral Waters, hath not been much cultivated until of late years, but from the Progress that has been made in this Study, it appears that the Principles impregnating these Waters at home and abroad, are the same; it also appears that both are good in the same cases, and it may with great truth be affirmed, that our Waters are eminent for effecting signal Cures in many Chronical diseases, which have proved rebellious to the most powerful Medicines as yet discovered.

It is very true, that our common Chalybeates are hitherto of no use but at their fountains; but there are two ways of obviating this inconvenience; the first is by adding a few drops of an Acid to any of them, according to the degree of their strength, *v. g.* from 5 to 12 of Oil of Sulphur or Spirit of Vitriol to a Quart, by which means they may be preserved with their original qualities entire, for many months. The second is, by a diligent enquiry, to find out such Chalybeate waters as are stronger than the common; or in other terms, such as are of an intermediate degree of strength, between the harsh Vitriolic waters of *Kilbrew*, and our ordinary Chalybeates, and which give some tokens of the Vitriolic principle.

Such

Such Waters I have found in this kingdom, and therefore beg leave to specify some of them, not doubting, but upon further Searches, divers others of the same kind would appear.

1st. That of *Killinvalshally*, near *Maguire's* bridge, in the Co. of *Fermanagh*. The 2^d is in the Co. of *Tyrone*, about midway between *Newtown Stewart* and *Omagh*. The 3^d, at *Dunbonrover*, in the parish of *Badonie* in the same County. The 4th at *Granshaw*, near *Donoghadee*, in the Co. *Down*.

These last mentioned, have been known without any addition to have retained their original ferrugineous taste, and property of striking purple with Galls, at a distance, even some of them for many months, having been carefully bottled, corked and refined. For a more minute account of these Waters, I refer to my History of the Mineral Waters of *Ireland*.

Of the Sulphureous Springs at LUCAN, near DUBLIN.

THE Sulphureous Waters of *Ireland*, have of late years recommended themselves to the public notice, by their good effects in the cure of divers chronical Diseases; but it has been a misfortune to divers invalids, among the numerous inhabitants of this metropolis, that there were none of these springs nearer than 60 or 70 miles, and consequently they were to many inaccessible at their sources, where undoubtedly their Efficacy is the greatest; but in the year 1758 a spring of this sort was found in the County of *Dublin*, situated about six miles from the city, which proved to be not inferior in strength to many of those in the Co. of *Fermanagh* and *Cavan*, the discovery and publication of which is owing to the generosity and public Spirit of the Gentleman on whose demesnes it is found, being situated at *Lucan*, in the grove about a quarter of a mile W. from the house of *Agmondisham Vesey, Esq*; a little to the N. W. of a Chalybeate spring in the neighbourhood, formerly in some repute, but now neglected.

The

The Well is near seven feet long, two feet broad and fifteen inches deep, and yields a large supply of water, containing 82 gallons, and when emptied fills again in an hour. The soil about it is sandy and Limestone. It is situated on the brink of the river *Liffey*, which in time of floods and all Winter overflows it, which the Gentleman above-named has in a great measure prevented, by building a wall, as well as furnishing proper accommodations, encouraged by the growing reputation and good effects of the water.

I shall exhibit the several experiments I have made on this water, in both the synthetical and analytical way.

It may be smelt at the distance of many yards, especially in frosty, or in rainy weather. It is limpid, and in the well has a bluish cast, and throws up a white bluish scum to the surface: it turns whitish or wheyish on standing and on rain.

It resembles the *Aix-la-chapelle* water in smell and taste, and is like our *Swadlinbar* water in smell, taste and every other appearance, but stronger, having the flavour of a boiled egg, and when strongest, of a semiputrid egg, and a smell like the washings of a foul gun, like the solutions of Sulphur.

It

It will bear carriage to remote places, still retaining in a great measure its original qualities, and exhibiting the like appearances with Metals and their solutions, as at the fountain, provided it has been kept in bottles, carefully corked and rofined as I have experienced, having kept it thus above twelve months; nevertheless it has a freshness and briskness at the fountain, remarkably greater than at a distance from it (A).

Its Sulphur is of a very volatile or fugitive quality; for when left all night exposed in a glass, it has very little smell, nor when left in a bottle corked and half empty, in which circumstance it also exhibited no blackness, but a whiteness with solution of Silver, nor any discoloration with Silver.

It is a light water, appearing by the hydrometer to be but a little heavier than distilled water.

The appearances with divers Metals and their solutions (evidences of the degree of the Sulphureous impregnation) were as follows:

(A) *Alexander M'Donnell*, Merchant, in *Dublin*, kept some of this water in bottles four years, and it still retained its fetor strongly; and he used it internally and externally in this state, for a Tetter on his arm.

Silver

Silver immersed in it at the well, in the most advantageous circumstances of weather, becomes almost instantaneously black; kept immersed in the water at the well a quarter of an hour in rainy weather, it became of a dusky brown colour, and next morning copper-coloured and black.

A silver Spoon and a polished iron key were kept suspended in the vapour of the water, in a corked bottle 48 hours; the first acquired a leaden colour, the last was rusted.

A. D. 1766. I repeated the same experiments with the same or greater success, for the Silver was quite black.

Gold immersed at the well, became of a deeper yellow.

A copper halfpenny kept some days immersed, grew blackish.

Some Shot in a bottle newly filled, quickly blackened the water.

Copperas in substance at the well, gave it a black or dark brown colour, and withal a deep red and blue Scum at the surface, a beautiful illustration of the formation of the variegated Scum on our ordinary Chalybeate waters, even from a coalition of the ferrugineous and sulphureous particles.

To

To these experiments, with the Metals in substance were altogether analogous, the following experiments on the solutions of some of them and others, and both agreeable to what happens upon the like Mixtures, of the artificial Solutions of Sulphur, with the Metals and their Solutions, *viz.*

The Solution of Silver precipitated from the water at the well a black sediment; in *Dublin*, dark brown clouds and grumes, as it did also with that which had been kept a year in bottles.

Solution of Sugar of lead, at the well gave a dark-brown cloud and sediment, but with that which had been two days bottled, it was of a turbid white yellowish colour, with a large whitish brown sediment.

The Solution of Mercury sublimate corrosive in waters, turns it yellow, and then exhibits yellow grumes floating, and at the well a dark brown sediment, and on standing a variegated pellicle.

C O R O L L A R Y.

The Sulphur is strongest at the well, and the water suffers some loss by carriage, tho' carefully bottled.

The

The Solution of Quicksilver in Spirit of Nitre, exhibited yellow grumes floating, and in a subsequent trial, black grumes above, yellow below.

N. B. This yellowness indicates a vitriolic acid, tho' far less than in the purging waters.

The Solution of the Chrystals of Mercury in Aqua-fortis, gives a dark brown sediment.

In order to a more explicit demonstration of the real contents of this water, I shall next examine the precipitates made from it, by some of the above Solutions: the black and dark brown Sediment, precipitated from the water by the solution of Silver put upon the red hot iron, gave a white flame: the Sediment precipitated by the Solution of Mercury sublimata corrosive gave a purple bluish flame, but the Sediment precipitated by the Solution of Sugar of lead, only sparkled on the red hot iron.

Next, all the three Sediments last named, being washed by repeated affusions of distilled water and dried to a black powder, this sparkled and gave a white flame on the red hot iron: from all which we may draw the following

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C O R O L L A R Y.

The sensible qualities of this water and the Experiments with Metals, and their Solutions, correspond exactly to our artificial Solutions of Sulphur: Indeed the Precipitates exhibited by the above-mentioned Metallic Solutions, tho' they manifest an inflammable Principle, do in some measure fail, with respect to the blue flame peculiar to Sulphur; but this is easily accounted for, because those precipitants, are partly compounded of the Precipitants, and so the appearances are disguised; but when to the foregoing observations and experiments, my reader shall add what will be subjoined in the Sequel, on the Analysis, I presume he will no longer doubt of the existence of Sulphur in these waters.

In the mean time, it will not be impertinent here to subjoin the result of the experiments made by the admixture of Acids with this water, not only as indications of its ant-acid, sweetening quality, but moreover, as exhibiting in common with several other waters of this Class, some vestiges of the *Lac Sulphuris*.

Now, as the ingenious Dr. *Lucas* remarks of the *Bristol* water, that, tho' it spontaneously emits plenty of Air-bubbles (as our *Lucan* water

ter also does) yet this Appearance is increased by the mixture of Acids, and even of Alkali's, but much more by the first, the same Observation also holds of our *Lucan* water, for, either Oil or Spirit of Vitriol, or Aqua-fortis, both at the fountain and at a distance from it, are found considerably to increase the natural fermentation of the water ; but moreover, some vestiges of a subtile *Lac Sulphuris*, may also be traced by means of the Admixture of Acids in this water. *Lucas*, however a strenuous opponent of the existence of Sulphur in waters, observed an appearance like this upon the admixture of distilled Vinegar, with the waters of *Aix-la-chapelle*, and the *Moffat* water in *Scotland* exhibits a like appearance : and I do affirm, upon careful and repeated observations made on the *Lucan* water, both at the fountain, and at a distance from it, that when a few drops of either Aqua-fortis or Spirit of Vitriol were added to a glass of it, there was visibly suspended a subtile, but distinct and conspicuous white cloud, analogous to a subtile *Lac Sulphuris*, or to an incipient precipitation of Sulphur, disengaged from the dissolving Alkali by the Addition of an Acid ; and this seems to be the more worthy of attention, because in other waters where a calcarious earth only is dissolved, the addition of these Acids is so far from producing this milky opacity, that it renders the waters more transparent.

Exclusive of this subtle sulphureous impregnation, this water has very few other contents, it being a soft water, and lathering with soap better than river water warmed; and Oil of tartar and Spirit of Hartshorn gave no opacity to it at the well; and as this water both in the smell and other experiments, agrees to a Solution of *Hepar Sulphuris*, that the Sulphur is also dissolved and kept suspended, by means of the native Alkali in the water, appears probable, from the following experiments: two quart bottles were filled on the 6th of August, 1763, at the well, and corked: into one of them were instilled twelve drops of Oil of tartar, per deliquium, the other was left unmixed: next day the respective waters was poured out into two phials: that which was unmixed grew wheyish in a few hours, but that which was mixed with alkali retained its transparency, even after it had stood all night: and Silver being kept immersed all night in both these waters, was much darker-coloured in that which was mixed than in that which was not mixed, the reason of which is obvious, viz. that in the first the alkali keeps the Sulphur longer suspended than it otherwise would be.

To this the following Experiments does not disagree, viz. Equal parts of Milk and Lucan water, being laid by three days, this last mixture

^ A Common Water & equal
parts of Milk

ture was less coagulated and less acid than the first; from which and the above experiments, the antacid sweetening quality of the water may appear.

The alkaline tendency of this water is confirmed by the following experiments. 1st, Syrup of Violets gave it a greenish colour, both at the fountain and in *Dublin*. 2d. The tincture of Ash-bark (a substitute for the *Lignum Nephriticum*, as a test of the presence or absence of an acid) is not destroyed by this water, when fresh and strong added to it, whereas a very small portion of an acid in a water, tho' not sensible to the taste, instantly destroys that blue tincture, as I observed in our *Dunnard* water; and moreover, *Lucan* water extracted a pale blue tincture from this bark, whereas one of our acid vitriolic waters extracted no tincture at all from it. 3d. It increases the greenness and tenderness of *Cale* boiled in it; an effect common to it and the waters of *Aix-la-chapelle*, as observed by Dr. *Lucas*, and shews the presence of the native Alkali. See the effects of the Salt in the Analysis hereafter. 4th. It extracts a deep red tincture from Logwood.

I proceed next to the natural and artificial Analysis of this water: in the first I shall examine

amine those contents which secede from the element, by the easy and flow progress of nature, without any violence of fire.

First then, besides the blue Scum thrown up to the Surface of the water every morning, and the greenness observable at the bottom and sides of the well, (and sometimes a redness, as before rain), we are presented with a certain white substance, deposited upon the stagnation or slow motion of this water, as it glides along the grass, moss and sticks, in its passage, and on the sides and bottoms of the tubs used in filling the water, as likewise on the stoney spout it runs over, being an appearance common to it and other sulphureous waters, and is a kind of magistery of Sulphur : for this substance being dried and rubbed between the palms of the hands smells as strong as if they had been rubbed with Sulphur. On the red hot iron it emitted a white flame, but on the same iron of a less glowing heat, it gave a blue flame with a suffocating smell, the undoubted characters of Sulphur, an appearance common to this and the like white substances, found in the passage of the lower springs of the waters of *Borjet*, as mentioned in p. 188, 189, Part III. of *Lucas's* Essay on waters, where that strenuous opposer of Sulphur in waters expressly acknowledges it ;
however,

however, I take this opportunity of observing, that this white substance, altho' it be undoubtedly sulphureous, is not purely such, but combined with an alkaline salt, which I apprehend will account for the appearances peculiar to Sulphur, not always answering, as being disguised by this foreign mixture: for when it was rubbed with Sal Ammoniac, it emitted a pungent smell, an evidence of an alkaline salt combined, and I observed the very same appearance on rubbing with Sal Ammoniac, the like white substance deposited by the water of *Pettigoe*, another of our sulphureous Springs.

The sulphureous quality of this white substance was further established by the following experiment, made on it by Dr. *Francis Hutchinson*, Lecturer of Chymistry, in *Dublin*: Being put into a *Florence flask*, placed on the surface of hot sand, there was sublimed into the neck of the flask, partly a black, sooty matter, and partly a yellow transparent one, which last manifested itself to be a true *flos Sulphuris*, by the blue flame and strong acid smell peculiar to Sulphur, which is emitted on the red hot iron; and the residuum in the flask made an effervescence with large bubbles, on pouring Spirit of Nitre upon it, agreeable to the foregoing experiment, shewing the composition of this white substance, deposited by these waters.

On

On the sides of the stoney receptacle of the water, is deposited a like white incrustation at the surface, and green underneath.

The next substance worthy of our consideration in the slow and easy process of nature, and which eludes the heat of our fires, is an appearance elsewhere described as frequent in fulphureous waters, viz. in bottles which have been sometime kept filled with this water, are found floating certain light bodies, resembling very fine *lamine*, leaves or flakes, being a sulphureo-bituminous matter, separating from the element, not having been so intimately dissolved therein, as not to be still apt to separate from it and unite again in its own self-attracting *molecule*.

These *lamine* or flakes, are of a dusky, reddish colour, and being dried, were of a shining, purple and greenish one: and it was observable that on pouring Spirit of Vitriol on them, they assumed a bright red colour.

These *lamine* did not flame, but only sparkle on the red hot iron: rubbed on silver they gave it a yellow and dark purplish colour.

It may be worth observing, that these flakes or *lamine*, which are common to other fulphureous waters, are all, more or less inflammable;

flammable ; and the above observation of their reddening with Spirit of Vitriol, answers to *Neuman's* observation of Oil of Vitriol becoming yellowish, brown, reddish or black, from the bare contact of any inflammable matter ; or in other terms, according to *Maquer*, a mineral fat ; and when to this is added the above-mentioned evidence of the Vitriolic acid in the water, we have the principles of Sulphur as well as in the waters of *Aix-la-chapelle*, according to *Lucas*.

The next Substance which naturally secedes from the element in the slow and gentle progress of nature is the Mud ; and this deserves to be taken notice of, the rather because of its analogy to the Mud precipitated from other waters of the same class, and its being used not absurdly as a Cataplasm by the common people, applied to their Sores (A).

This Mud, whether found at the bottom of the well, or in bottles which have been kept some weeks, is black, and in some spots that from the bottom of the well was as black as *Æthiops* mineral ; even as *Lucas* says of the

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Mud

(A) At *St. Amand's* in *Flanders*, they apply the Mud of their Sulphureous Waters with great industry and happy Success in chronical Rheumatisms, Paralytic Limbs, and even in Anchyloses, bathing in and rubbing it on the parts for 5 or 6, sometimes 9 or 10 hours in the day.

Mud and sediment of the waters of *Aix-la-chapelle*, which he says is owing to the precipitating Sulphur (a very liberal concession from a strenuous opposer of Sulphur in waters), and that this is really also the case of the Mud of *Lucan* water, appears from the following examination of it.

It must be confessed. that upon an experiment made, no Flowers of Sulphur were obtained from it by distilling in a mild heat, as from the white glairy substance above-mentioned, it being less purely sulphureous than that; however, being dried it smelt strongly sulphureous, like the *Hepar Sulphuris*, and the water with which it was washed, in order to separate the sand from it, tinged a silver tankard of a dark brown, green and black colour. It loses part of the blackness on being dried, but still smells sulphureous, and much more so on being burnt on the red hot iron, whereon it sparkled a little, and emitted a highly fetid smell on boiling with Oil of Olives.

Also, the Sediment precipitated in bottles, kept some weeks was black, and somewhat tenacious under the fingers, of a strong smell, and stunk on the red hot iron.

From this observation joined to the foregoing, concerning the laminæ or flakes, separated from

from the water on keeping, we may draw this useful inference, that the Water at the fountain is the most efficacious; and that it cannot be kept for any length of time without the separation and loss of some of the bituminoso-sulphureous particles.

I proceed next to the artificial Analysis:

A quart of this water was put into a glass body and head, well luted: and in order to prevent any dissipation by too great a degree of heat, it was placed on the surface of hot sand, and an Ounce only was drawn off, which had neither smell nor taste, and continued clear with the solution of Silver. The like Experiment has been made on some of their sulphureous waters in *England*, with the like result; from whence it should seem to be impossible to collect the subtile volatile parts impregnating this water in any chemical vessel.

In exhaling on the sand heat it was very fetid and gave but little scum; but a gallon of it left 30 grains of a whitish brown or grey sediment, which was of a saline and strongly urinous taste, excited an ebullition with Spirit of Vitriol, soon turned of a bright green with Syrup of Violets, and of an orange colour and red with the solution of Mercury sublimate corrosive in water, and smelt pungent when rubbed with Sal Ammoniac, all concurring evi-

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dences of an alkaline salt, the last especially a peculiar mark of it, since the calcarious earths alone do not extricate the volatile alkali from Sal Ammoniac without heat, as *Neuman* observes.

Agreeable to the foregoing experiments were the following made on the *residuum* of this water with human blood, and the flesh of animals,

Mixed with blood flowing from the vein in one porringer, this became florid and tender, whilst the blood flowing from the same vein of the same person received into another porringer was tough and sizey.

Mutton on which it had been rubbed, became of a red colour, and Beef in three different experiments made in three different years, became more red and more tender (an effect common to alkaline salts natural and artificial).

This *residuum* moreover moistened in the air, like common Salt, and being rubbed with the Oil of Vitriol it emitted a white acid fume, like Spirit of Salt, as it undoubtedly is, the alkaline salt being combined with marine Salt, a combination very frequent in the sulphureous waters abroad and at home, as particularly in the waters of *Aix-la-chapelle*, *Bourbon*, *Mount d'Or*,

d'Or, in the *English* waters of *Sutton-bog*, *Chadlington*, *Wigglesworth* and *Bilton*, described by Dr. Short; and in our *Irish* sulphureous waters of *Swadlingbar*, *Mechan*, *Ashwood*, *Derryhence*, *Derrylester* and *Killasher*.

The same residuum melted, stunk and sparkled on the red hot iron.

The residuum of some of this water which had been kept a year, and from which the floating particles had been separated, in exhaling and taking it off, was fetid, and it stuck closer to the pan than the residuum of *Francis-street* water, whence something bituminous may appear.

I separated the Salt from the indissoluble matter, and obtained near two parts of the first to one of the last.

This Salt separated from the indissoluble matter, is yellow, and the Solution of it in distilled water is of an urinous taste and smell: it turned of a deep orange colour with solution of Mercury sublimata corrosive in water: rubbed on Mutton, laid by and then boiled, rendered the flesh of a dusky red, and much more tender than did the Salt obtained from *Wild's* purging water in *Francis-street*, *Dublin*, upon an accurate comparison of the effects of both: the Solution of the Salt in distilled water, had similar effects on Beef.

The

The same Salt excited a great ebullition with Spirit of Vitriol and with Spirit of Salt.

Its Solution in distilled water was clear with Oil of tartar, *per deliquium*.

It turned presently green with Syrup of Violets.

The alkaline quality of this Salt, even as altogether similar to that of the fossil Alkali, which is the basis of the Sea Salt, further appears from the two following experiments.

1 ft. On a strongly saturated solution of it, Spirit of Salt being poured unto saturation, the mixture became of a salt taste, like marine salt.

2 d. Oil of Vitriol being poured on another portion of the solution of the same salt unto saturation, or nearly, the mixture became of the nauseous bitter taste proper to the Sal Glauberi.

Lastly, the distinguishing quality of this salt as an Alkali, or as a Salt wherein the Alkali is predominant, even as distinct from that of the *Pump-water* in *Francis-street, Dublin*, in which the marine salt predominates, appears from hence: the first added to pure Spirit of Nitre does not dissolve pure leaf gold, which the Salt
of

of the *Pump-water* in *Francis-street* does, being a marine salt, and so constituting an *Aqua-regia* with Spirit of Nitre, whereas the Salt of *Lucan* water is an Alkali predominant over a small portion of marine salt.

The indissoluble matter left in the filtre and separated from the saline, was grey, raggy, smelt a little sulphureous, sparkled on the red hot iron, and in a subsequent experiment emitted a white flame: it made a great ebullition with spirit of vitriol, and turned slowly green with Syrup of Violets.

After I had separated the particles of the *residuum* of *Lucan* water (left upon exhalation to a dryness) which gave a yellowish tincture to Alcohol and the saline by distilled water, I poured Spirit of Nitre upon what was left, which caused a great ebullition, but did not dissolve the whole, but left a small quantity of black matter untouched, which being washed in distilled water and exhaled to a dryness, emitted a white flame on the red hot iron.

C O R O L L A R I E S.

1 ft. The natural and artificial Analysis both agree in presenting us with an alkaline Salt and an oily or inflammable matter: here is also a small quantity of calcarious earth.

2 d.

2d. It must be confessed that it is very difficult to exhibit a real, distinct, palpable Sulphur from any water, because it exists in so small a quantity, and in so highly attenuated, subtil a state, and withal so blended with other minerals, as to be partly disguised and partly dissipated in our processes.

So much shall suffice for an attempt to investigate the minerals impregnating these waters: I proceed next to what is of more importance, their real effects and operations on the human body, from the Observations that have been made, during the space of eleven years from their first discovery, and those observations on individuals, frequently continued for several seasons, and such as I trust shall establish their reputation, as long as thro' the bounty of Providence they shall continue to flow.

As these Waters have been effectual in the cure of different cutaneous disorders. I shall premise the diagnostics of some of these, in order to assist the younger practitioner in his judgment, concerning the proper application of them.

Happily for us, the Leprosy known among us, is chiefly, if not solely, that milder sort which is called the Leprosy of the *Greeks*, and it is thus

thus described from Willis (A). *Impetigo varia sortitur nomina, Lichen, Vitiligo, Lepra Græcorum, &c. Imprimis papillæ seu pustulæ rubræ modo singulares, modo plures simul congestæ, quibus singulis novæ adjunguntur, & latius serpentes sese in orbem diffundunt: cujusque harum superficies & nonnihil albida & squamosa apparet, unde si scalpatur, squammæ decidunt, & ichor sæpe tenuis exsudat, qui tamen mox exsiccatus in squammam rursus crustaceam indurefcit* — *Est naturæ mediæ inter Scabiem (Pforam) & Lepram; differt a priore quoad pustularum formulas; namque, in Pfora ubique fere singulares, & spatiis licet exiguis, ab invicem remotæ, existunt; hic plures conglobatim & quasi per racemos magis intervallis sejunctos erumpunt. Lepra multo immanior est, & horrenda videlicet crustacea & squamosa, ubique continua & per totum corpus diffusa.*

Lommius (B) distinguishes the *Impetigo* from the Itch thus: "*Impetigo siccas pustulas habet, omnis tum humoris tum saniei expertes.*"

The *Herpes* is thus described and distinguished by the last named Author. "*Herpetis duo sunt genera, alterum simplex & mitius, alterum, exedens & ferum. Simplex minimis pustulis cutem exasperat leviterque rodit, & rubore suffundit, & pruritu sollicitat, in orbemque fere se proqdit, ac plerumque*

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sanefcente

(A) Allen Synop. Med. Pract.

(B) Medicinal Obs.

sanefcente medio extrema latius vagantur—pustulas exhibet milio fimiles. Ubi vero papulae sunt exedentes, fimiliter quidem, verum magis cutis, non summa, sed tota exulceratur, magisque & roditur & rubescit: ex pustulis ruptio ulcuscula sunt arida, sine sanie, sine prure."

That particular species of the *Herpes* or *Serpigo*, which is called the *Tetter* or *Ringworm*, is thus described (c). "*Pustulae minimae accumulatim exsurgunt, quandoque; figura rotunda vel annulari cum dolore & pruritu infigni. Serpigo ad digestionem nunquam pervenit, tantum ex scalpura humore tenui diffluit."*

Now in most of the disorders here described, the *Lucan* water from its first introduction hath proved successful, especially when drank at the fountain, as well as used externally, and patiently persisted in, even sometimes for several seasons.

From twenty instances to this purpose I shall select a few, and in the course of these and the following narratives, I shall endeavour to avoid all affectation of Eulogiums in the manner of Quack Advertisements, but on the contrary candidly relate the defects and failures of success in the use of these waters.

A. D.

(c) *Allen Synopsis. Med. Pract*

1. A. D. 1759. A Woman aged 55, had eruptions of the Tetterous kind all over her body and limbs, with prodigious itching ; — she had drank sea water and used purges to no effect, but on drinking a quart of this water every day during summer, her skin became smooth, tho' on her leg one mark of the disorder still appeared : it operated by sweat.

2. 1760. A middle-aged woman had small pustules on the hands and between the fingers, attended with great heat, pain, itching and fissures in the skin, depriving her of sleep, and going off in a white scurf. She drank the water in *Dublin*, to a quart every morning, for some months, and recovered.

3. 1763. A *Herpes* on the leg, with tumor and inflammation, and lameness, in such a state, that, being viewed by a Surgeon of eminence, it was pronounced to have been not curable without a long course of medicines, was cured in three days by drinking the water, bathing the part and applying the mud.

4. May, 1761. A man aged 26, upon the suppression of an hemorrhage at the nose, which had attended him for several years, was frequently troubled with large Tettors, moving from one part of the body to the other, and now has one on the Arm, round, itching, and leaving a white scurf : withal he had several

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symptoms

symptoms of a *Tabes pulmonalis*. He took from one to two quarts of the water in a day, with one-third milk. It banished the Tetter and he recovered flesh, tho' he had still some remaining complaints.

It should seem to deserve the preference to *Malverne* water in this respect, that whereas Dr. *Wall* acknowledges that water to fail in the dry *Lepra*, ours, on the contrary, from a registry kept at the well, appears to have been effectual in the cure of the dry as well as the moist; several instances being recorded of its good success in the dry, white scaly kind, being drank at the fountain in various doses, as from three pints in the morning and three in the evening, to two quarts in the morning and one in the evening, for three weeks, for a month or five weeks.

The following Case was communicated by
Doctor *John Kelly*:

"An unmarried Lady in her Twenty-sixth year, was from the earliest Age on the return of every Summer, subject to a Tetter which covered her face entirely, and appeared in large Blotches on her Neck and Arms.

The Eruption on her face formed a white Incrustation on the surface of the skin, that peeled off in a succession of Branny Scales;
that

that on her Neck and Arms was of a lurid red, and there oozed from it a sharp Serum, which corroding the contiguous Parts, expanded widely in a cuticular serpiginous ulcer: in the other respects she enjoyed a perfect state of Health, was of a robust, vigorous frame; free from nervous or hysterical Complaints, and at no time of Life subject to any Obstruction or Irregularity of the Menfes. As the cold season advanced the Eruptions always disappeared: and thus thro' a series of years, she whose Complexion in Winter was remarkably clear and florid, became on the approach of Summer an Object loathsome to herself and disgusting to those who beheld her.

To remove this obstinate and nauseating Disease, the most promising methods of cure had been unsuccessfully employed, she drank the Sea Water and bathed in it five or six years successively; had taken a Variety of Antiscorbutical Decoctions and Diet-drinks, used the antimonial *Æthiops*; the lesser compound Lime Water, *Succi Scorbutici*, Sudorific Decoctions, and even some of the saline Mercurial Preparations, together with a diluting cool Regimen, were at different times prescribed her; but tho' these Medicines, it is true, frequently palliated the Disorder, yet they never had taken sufficient Effect to prevent its returning on the Decline of the cold Weather, with almost its usual Virulence.

Tired

Tired of Medicines, she was in the summer of the year 1763, easily prevailed upon to try the *Lucan Water*, which she drank at the fountain to the quantity of six half Pints every Morning during the course of two Months.

At the expiration of three weeks, there was an evident amendment, in fix the Eruptions totally disappeared.

On the succeeding Spring of the year 1764, she was threatened with the renewal of the Disease; but its progress was so mild at this season, as to be imperceptible to any who had not viewed her in a full light, and with an attentive Eye. She again returned to *Lucan* and drank the Water in the summer of that year, and is now [in May 1765] perfectly clear of all Tetter or foulness of the Skin.

A. D. 1766, *February*. A man aged 34, had for many years dry, white, leprous crusts on his arms and legs, each of them nearly of the dimensions of the palm of one's hand, which crusts likewise covered part of his ears and face.

In *April* following he fell into a severe Dy-sentery, upon which he grew much better as to his cutaneous disorder; but in *July* this returned with intolerable itching, until he took
first

first four pints of the water in a day for two weeks, and afterwards half that quantity, and before the summer was over, the itching was almost vanished, and there remained only one white broad crust on the arm.

5. To several instances of the inveterate Itch, and to the accounts I received from the *Poor-house* of its efficacy in cutaneous cases, not giving way to Mercury, I shall subjoin a few stubborn cases of this sort, partly to shew the real effects of the water, and partly to intimate the necessity of a perseverance in its use for several seasons, in the worst of these cases.

1761, *October* 20. A man aged above 50, had all the preceding Summer laboured under an inveterate Itch, the *Scabies fera*; his Legs were covered with a crusty Scab discharging water, with a great itching, and the buttocks in like manner affected, so that he could not sit. He was admitted into *Steevens's-Hospital*, where he drank the water from two quarts to three every day, for the space of a month, and washed the parts with a decoction of *Guaia-cum*, and his Skin became supple and smooth, tho' at the first use of the water, the pustules and itching were increased. He continued well for several years, but A. D. 1766, his disorder returned.

June

June 27, 1765. A man aged thirty, in an impoverished state of blood, in consequence of several Fevers, was distressed for some weeks with pustules over all his body, discharging a lymphatic humour, as from a blister, with white scales in the interstices, which weakened him and almost confined him to his bed.

He took Guaiacum, Burdock root and the Water-dock with some relief: but July 22, he came to *Dublin* with the appearance of an inveterate itch, the pustules partly purulent and partly lymphatic, with itching and burning, and leaving here and there a crusty scab, and withal he was stiff in his joints.

He now began to drink the water, first to a quart morning and evening, and increased his dose to three quarts in a day. It operated by urine and sweat largely.

He persisted in the use of the water till September 16, when the pustules were almost vanished, and he had no stiffness, except in his fingers.

1759. A man of about 40 years of age, hereditarily scorbutic, and instead of exercising a proper regimen to preserve a bad constitution, became a most unhappy victim to the inordinate use of spirituous liquors, in consequence
of

of which he destroyed the constitution both of his body and mind, having been for some time Maniac, and over-run with superficial ulcers in divers parts, for which he was twice salivated, but the cure was only temporary; for his disorder returned and assumed the shape of an inveterate, fiery Itch, with a loss of appetite.

In this state he drank the water to a quart and a little more in the morning, for about three weeks, and washed the parts with it. It purged him a little in this small dose. His skin cleared and his appetite was restored, but the disorder returned the next year, 1760, and he repeated the use of the water in summer for about a month, and his skin was again cleared; but his distemper eluded the power both of Mercury and of Sulphur.

This however, among others, is an incontestable evidence of the propriety and efficacy of these waters, as a sweetning and balsamic medicine in the scorbutic acrimony, and far less distressing to the constitution than Mercury.

A. D. 1760. A man aged 21, was troubled last winter and in the spring of this year with tumors like those called blind Boils (A), hot,

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very

(A) *Furunculus* (a Boil) est inflammatio parva in locis externis orta, in acutum tuberculum tendens, ovum columbinum magnitudine

very painful, and not easily suppurating ; they covered his legs and and ancles. He had recourse to proper chyrurgical assistance in *Dublin*, and was bled, took the mercurial pills and decoction of Guaiacum, and at length an artificial Sulphur water, all with only a little temporary relief : then he went to *Lucan*, and drank three quarts of the water in a day, partly in the morning and partly in the evening, for two months : at his first drinking of the water the parts became more inflamed, for which reason he was bled, and after that pursued the use of the waters till *October 23*, when he was perfectly recovered.

A Lady aged about 53, of a delicate and most easily irritable state of the nerves, with a scorbutic acrimony in the blood, almost to the degree of a leprosy, with great itching, a watery discharge, and in some places, great fissures in the skin, and white scales, or a bran-like appearance ; and when these external disorders disappeared, she was distressed with such nervous complaints as usually attend the hysteric disease in the highest degree ; and *vice versa*, when her skin grew worse, the internal complaints vanished.

She

mitudine non excedens, cum rubore & dolore, interdum cum ardore atrocissimo.

Etmuller apud Allen.

She drank the waters of *Swadlingbar* in the summer 1756, with great relief, both as to the cutaneous disorder and otherwise; for which reason she repeated those waters in the summer 1757, but not with equal success, for they did not pass well, whereas the Chalybeate water which is in the neighbourhood agreed better, as did also the *Pouhon* water, but not the *Pyrmont*. She continued for some time after to be alternately affected with the external or internal disorders above mentioned, until the use of our *Lucan* water began to prevail, and since that time spent several seasons there with considerable benefit, altho' not a complete cure.

This case shews us the uncertainty of the operation and effects of medicines: for we here see that the same water in the same subject, agrees at one time but disagrees at another; and that waters of the same general denomination differ in their effects in the same subject.

1763. A lady hysterical and scorbutic, had tetters eruptions with great itching, and black spots on the skin, and when these disappeared, she was distressed with flatulence, the gastric juices were so far viciated, that she sometimes had a sweet taste like liquorice: she had also a numbness in her limbs and had lost her appetite and flesh: She had drank the waters last year and they purged her a little, and by their

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effects

effects was so far encouraged as to repeat them this summer, and drank a quart in the morning daily for six weeks, and grew much better, fresh eruptions appearing on her skin, the complaints of the stomach became much less, her appetite was restored, and her complexion mended.

A. D. 1766. A man aged about 45, having been many years troubled with Eruptions on the skin, was unfortunately prevailed on to use an ointment of the repelling kind, which answered the end, but was succeeded by worse evils, viz. excruciating pains in the bowels and an asthma.

In *August* he drank these waters to a quart daily, and increased the quantity after, continuing the use of it for a month : it renewed the eruptions in his skin, and he was relieved both from the excruciating pains of his bowels, and his asthma became less severe.

He was dissuaded from the further use of the *Lucan* water, but other medicines were prescribed in vain, and he died next winter.

I would not insinuate from the foregoing histories that this water is effectual in the cure of all cutaneous disorders : on the contrary, it has appeared from observation that several of these resist it, particularly some red pimpled faces,

faces, or the *Gutta rosacea*, in which also Dr. Wall observes the *Malvern* water to have failed, tho' successful in the cure of the itch and leprous disorders.

1. A. D. 1760. A man aged 33, for some years had pimples on his face, which sometimes came to suppuration, and were exasperated by a hot dinner and by drinking wine. He drank the water to a quart in the morning for two months, without any effect.

2. The same year, a fair lady aged about 36, whose skin formerly perspirable, for three years past, became dry, with small red efflorescences on her face, which either by drinking wine, or an approach to the fire, affected her with a Sense as of burning. She drank the water to a quart in the morning last summer and autumn, without any benefit, and by washing the part with the water, it became more inflamed.

In these two last cases the water seems to have been too active. Might not the cooling purging waters, or the Chalybeates, or both, properly prescribed, have succeeded better?

But the Event proved more happy in a young woman aged 29, whose face had been three years deformed by that species of the *Gutta rosacea*, which is distinguished by the name of
rubedo

rubedo pustulosa, being covered with small pustules which came to maturation, tho' very abstemious from the use of any inflaming liquors. In the year 1763, she drank the water six weeks and was cured, nor has suffered any relapse to this present year 1765; and yet in another instance where this disorder was more malignant, and had arrived to that state which is called the *rubedo ulcerosa*, this water was ineffectual.

Also in a moist Leprosy it failed, rather exasperating the complaint and inflaming the parts, after three years use of it.

But to return to the *Herpes*, there is one species of it above defined, viz. the *exedens* or ulcerous sort (a frequent disorder among our poor, and very stubborn, sometimes cured by Salivation, sometimes by Sea-water, but apt to return) in the cure of which this water was, as its first introduction into use, recommended by the sagacious *John Nichols*, Surgeon-General, by drinking and bathing the parts; nor was he disappointed in the event, for there were numerous instances of its efficacy in this case, among which it shall suffice to select a few, viz.

1. A. D. 1759. One in the Arm in a Man, from the Co. of *Kildare*, was in a healing way in a fortnight's drinking and washing with the water.

2. A. D.

2. A. D. 1761. A middle-aged woman, over-run with numerous ulcers of this sort on the breast and arms for some years, drank this water, and made her Stirabout with it, and washed the part with it last season and this, and the parts are now all healed, smooth and white.

3. A. D. 1759, *Sept. 13*. A man aged 30, had several of these Ulcers on the arms, legs and thighs. He has bathed the parts with the water and drank it to three quarts in a day for some weeks; the arm is healed, the knee is better, as is his countenance, and he has gained flesh. He pursued the course the next season 1760, and 1761.

July 22. All the Ulcers are healed, except one in the thigh.

4. In a fourth instance, to which I also was a witness, which was of several years standing, this water soon manifested its healing quality, and the Cure was very nearly completed at length, by Lime-water (B).

I shall

(a) Dr. Kennedy however, affirms of the *Ballynahinch* water (which is not so strongly impregnated with Sulphur as ours) that it far excels Lime water in the cure of Ulcers, and that it has been particularly successful in the cure of the *Herpes exedens*, by drinking and bathing.

I shall next, as a farther proof of the balsamic healing quality of this water, relate some of its good effects in Excoriations.

A. D. 1760. A man whose Gums were eroded and covered with a purulent matter, drank the water for six months, and tho' he then had received no apparent benefit by it, yet on continuing the use of it, his gums were much mended, both as to the purulent appearance, and recovering their firmness, so as to cover the teeth: and several other instances occurred of their good effects in erosions and ulcerations of the throat, mouth, gums and eyelids, in one of which Mercury had been used in vain (c).

A Patient of mine who had excoriated Gums and loose teeth, was cured on washing his mouth with the water and drinking it at the same time; and several other instances occurred of sore mouths and putrid Gums, wherein the waters were drank with signal benefit.

Before I dismiss my account of the good effects of this water in cutaneous disorders, I shall

(c) Dr. Wall, in his account of the virtues of *Malvern waters*, takes notice of Erosions in the *tonsils*, *uvula*, and *velum pendulum*, which had been exasperated by Mercury, cured by that water.

shall here annex a memorable history of an Hemiplegia, partly as giving suspicion of its being symptomatical with respect to a scorbutic acrimony, and partly as an indication of the Waters not being so injurious to the nerves as the unexperienced might imagine.

1760. A man aged about 54, of a robust frame, and a free-liver in his youth, last summer had eruptions on his skin, and was seized with an Hemiplegia affecting his left arm and leg, and withal had a faltering in his speech, and his mouth was turned awry: he was relieved of the two last-named Symptoms by the use of medicines, but the Hemiplegia still continued, as did also the cuticular eruptions, in regard to which he was desirous of drinking the *Lucan* water, but was not much encouraged thereto by his physicians, fearing lest it might prove hurtful, in regard to his paralytic disorder: however he adventured to drink it last summer, even whilst the arm and leg affected were yet cold, benumbed and tingling, and his appetite lost.

He was costive whilst he drank the water: it passed well by urine and sweat, and sometimes excited a little giddiness: he sometimes mixed a little spirit of Lavender with the water; he increased his dose gradually until he took sometimes at home, and sometimes at the fountain 6 or 7 pints in the morning: he inter-

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posed

posed the use of tincture of Rhubarb once in ten days : it restored his appetite and never chilled his Stomach : it passed off in large fetid sweats : it excited a great pain in his foot, which was followed by blisters at the root of his tongue, and small, hot, itching eruptions over the whole paralytic side, which was restored to sense and motion, tho' not so strong as in health.

He repeated the use of the water this second summer, 1760, on which there appeared on the palm of his hand of the side affected, one round red spot, and the sound arm was covered with small fiery pustules ; and in consequence hereof, he was restored to a good state of health, tho' with loss of flesh ; nor had he any return of the paralytic disorder either in his tongue or limbs since his use of the water.

Numerous other instances occurred of the good effects of this water, in relieving internal disorders, by expelling the vicious humours to the surface of the body. A. D. 1766. A man aged 30, in consequence of an ill-cured itch and an impetiginous disorder, of which evident signs appeared, in a redness and marks of a desquamation on the ancles, knees and arms, was seized with tremors, anxiety, sleepiness, and a stupor and coldness in one leg, and withal lost his appetite.

Purging

Purging having been premised, he rode to the well daily and drank for ten days a pint and half every morning: it operated by sweat (in this summer season) some fresh eruptions on his skin appeared, his appetite was better, and the nervous complaints were abated.

Of Ulcers.

A. D. 1760. *July 22.* **T**HE use of this valuable water having been for a considerable time introduced into *Steevens's* Hospital, on enquiry I received the following report from *Richard Butler*, the Resident Surgeon: that of 13 Ulcers which were very fordid and untractable to Mercury, Antimony and Guaiacum, 5 were cured by drinking *Lucan* water, some few of whom it purged, but gave a voracious appetite to them all.

A. D. 1759. *July 16.* A middle-aged man, and Inn-keeper, and too much given to spirituous liquors, had for several years been troubled with a kind of superficial Tetterous ulcers, with a lymphatic discharge and great itching, first in one leg, then in the other.

G g 2

He

He began with drinking a pint in the morning and the same quantity in the evening, and gradually increased his dose until he drank 4 quarts in a day for 5 weeks, and every 4th day took some of the purging salts.

September 13. His legs were healed, and continued dried up until the summer 1760, when the sores broke out again, and he repeated the use of the water for two months, both drinking and washing the parts with it : it bound his belly, and

August 16, 1760, the sores were dried up.

1763. On the drying up of the Sores, he became gouty ; but on drinking the water, the sores were renewed and he grew better.

1765. Besides the gout; he had other disorders and a cadaverous look ; and died in *August* this year : and I make no doubt but he had been better with his sore legs than without them, and probably his life might by means hereof have been protracted.

A middle-aged man of a gross habit, had for three years an Ulcer in his leg with a watery discharge and great itching, which not giving way to other methods, besides Sea-water used externally and internally, which exasperated the Sore, he had contracted with a Surgeon to salivate him : withal his urine was extremely foul,
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so that it had the appearance of flummery mixed with it.

A. D. 1759. *Sept.* 21. He began to drink the water to about four quarts in a day, and besides drinking, he washed his leg with his urine thus impregnated with the water, tho' the first week it did not pass freely, nor was the consistence of his urine changed, but in a fortnight he began to piss freely, and the leg was sensibly better, and in a month's drinking, it was all healed smooth, except one small spot.

March, 1760, the Ulcer broke out again as bad as ever, but a spontaneous Dysentery with bloody and purulent stools, appears to have been of signal use to him, for the Ulcer hereupon entirely dried up: However in *June* 1760, he again drank the water by way of precaution for some time, to five quarts in a day, upon which some fresh pustules appeared on the leg; but *September* 26, it was entirely healed, and the above cure continued good to *June* 1765.

N. B. Here is a much easier cure of a stubborn Ulcer of the leg than a Salivation, but the empirical conduct hereof strongly hints the expediency of proper evacuations (where the strength of the patient will bear them) to be joined to the use of the waters, even from the
happy

happy consequence of the spontaneous Dysentery which followed his relapse and probably prevented the progress of his returning disorder, with which he was threatened.

1760. A man aged about 40, had for several years been troubled with superficial ulcers on the ancles, with a watery discharge, he drank these waters last year to six pints in a day for 13 weeks, and moreover he drank them also at his meals; and tho' he found no apparent benefit by them, he repeated them this second season and was cured; and likewise, an inflammation at the stomach which attended him, vanished.

1764. A man aged about 55, of a scorbutic habit, manifested by habitual red efflorescences in the face, which retiring for three years last past, were succeeded by a worse evil, viz. an inflammatory tumor on his ankle, which being opened, was succeeded by sordid sinuous Ulcers and a fungous flesh, with burning heat and pain, especially in the evening and night, depriving him of sleep. It did not give way to any medicines internal nor external, nor even to a Salivation of three weeks, and the fungus did not bear the mildest escharotic.

In this state, *June 19*, he began to drink the *Lucan water in Dublin*, first in small quantities, and

and mixed with milk, gradually increasing the dose until he drank six pints in a day.

July 14, his pain was much abated, infomuch that he was encouraged to go to, and pursue the water at the fountain, which he did *August* the 4th, where he drank a gallon in a day, and applied the Mud to the part, but this proved painful, and therefore he afterwards only applied linen rags dipped in the water.

August 20, the fungus was much less, and the pain greatly abated, one of his Ulcers was cicatrized, the other less and his appetite good. He persevered in taking the water in the quantity above-mentioned, and washing the part daily till *October* the 15th.

December 3. The Ulcers are lessened and disposed to heal, and he sleeps well, and takes now only a quart in the day and washes the part.

1765. *March 26*. He continues to drink a quart in a day, and the Ulcers are disposed to heal, and not attended with acute pain as before: But having lately felt some return of pain in the part, he went again this summer to the fountain, but drank it immoderately, sometimes to seven quarts in a day, and it chilled him. He also washed the sore with the water, which healed it, but this was succeeded by two small ulcers on the other side of his foot,

foot, with a discharge of laudable pus, but attended with a burning heat. He therefore rejected any further use of the water; but had he persevered in the use of it in small quantities, it is probable his cure might have been compleated.

I am far from presuming to assert this water to be a speedy and effectual cure for every Ulcer: on the contrary, a patient of mine in the year 1760, of about 40 years of age, had an Ulcer in the leg of many years standing, attended with great pain and a sanious discharge, and on the use of this water to a quart in a day (for a greater quantity could not be borne, affecting the brain) for six weeks, which kept the belly soluble, the discharge from a bloody condition became more laudable: — it gave alacrity and a good appetite. After a month's drinking, the part was bathed with the water mixed with one-third of warm water; but this was found to be too drying, lessening the discharge, and bringing on pain and swelling. The further use of this water was discontinued: the patient enjoyed a better state of health after, but the Ulcer still continued.

July 1, 1766. A Woman aged 60, had for five years been troubled with a tumour extending from the ankle to the middle of the leg, which seemed to be of the oedematous kind,
was

was of a purple colour, and not attended with any considerable heat, but lately with itching, pain and ulceration, and an ichorous discharge.

I ordered six drachms of Glauber's salt in a quart of one of our purging waters, to be taken every fourth day, and in the intermediate days a pint of *Lucan water*.

July 7. The Pain was increased and the Itching troublesome, but abated upon a repellant application.

July 15. On the continuance of the *Lucan water*, the itching, pain and discharge were much abated; and on persisting in the use of the water a month, the Ulcer was cicatrized by no other means than the use of a cooling ointment.

The following is a no less striking instance of the sanative quality of our water, *viz.*

1764. *July 4.* A woman aged 32, after a contusion in the hypogastrium, had for four months past a perpetual severe pain in that region, and after that a large hemorrhage from the womb, which was followed by a purulent discharge, attended with flatulence, lost appetite and strength. I ordered a pint of the water morning and evening.

July 8. She had drank the water in a much larger quantity, with an amendment of her appetite, and an abatement of the pain, but now had a discharge of a white matter like milk.

August 15. Having persisted in the use of the water to three pints in a day, her appetite and strength returned, the discharge lessened and she had for many weeks past vesicular eruptions on the skin, very hot and as it were burning in the night, not by day. I ordered her to persist in the use of the water.

Scrophulous Cases.

AS the Sulphureous waters of *Moffat* in *Scotland* are eminent in the cure of these disorders, and it was formerly in practice to send some of these patients thither from this kingdom, we are now supplied with a water nearer home, in some respects preferable, and from the following instances there seems to be good ground for supposing it to be equally efficacious,

1. A. D.

The *Lucan* water was sent over to him, and he took a pint of it in a morning for several
H h 2 summers.

summers. It was very disagreeable to him at first, and vomited him : but afterwards it agreed well and restored him to his appetite and flesh ; and in the year 1765 he continued in a good state of health.

Diseases of the first Passages.

HOWEVER offensive this water may be to the nostrils, it is certainly very friendly to the stomach and bowels. It is true it sometimes excites vomiting at its first use, but one of its most constant effects is to restore appetite, and in several instances to this purpose the loss of appetite was also accompanied with loss of sleep (probably from the fumes of indigestion) and both were restored by the drinking this water, in one of which, a man aged sixty, who had been long invalid, with a loss of appetite and sleep, and had used many medicines, and even the waters of *Bath* and *Bristol* ineffectually, grew much better on drinking these waters about a fortnight; and two others who had lost their appetite and sleep, regained both
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on drinking a quart every morning for some weeks.

I have numerous instances in my registry of their curing such as were subject to reject their food by vomiting. It shall suffice to specify the following :

1. A. D. 1761, *Sept.* 8. A man aged about 68, gouty, and of a sedentary life, had a total loss of appetite, with sour and bitter eructations, and sometimes vomiting, sometimes a Hickup, with a preternatural thirst. He drank half a pint of the water in the morning in town (being brought from the well and carefully bottled) for a week or more, and was much better. In 1762 he had some return of his disorder in a less degree, and repeated the use of this water, but in a larger dose, *viz.* to a quart in the morning, and his complaints vanished after he had drank six quarts.

In 1763 his disorder returned, and he repeated the water, but not with the same success as before, his declining strength seeming to call for some portion of a more generous liquid.

1766,

(A) This History convinced me that this water may be safely taken by the gouty ; and I was confirmed in this opinion from the case of a younger man, who having had some slight fits of the Gout, on drinking this water for about a month, had a smarter fit than he had before for some years.

2. 1766, *April* 22. A woman aged 27, who had been a valetudinarian for years, but especially in the last winter, during the space of three weeks last past, rejects by vomit every thing she takes liquid or solid. The region of her Stomach is inflated and hard. I ordered her cautiously a quarter of a pint of this water every morning.

April 26. She retains the water, but nothing else. I ordered her to increase the dose to six ounces in the morning.

June 9. She has lately taken half a pint in the morning, which is grateful to her stomach, and her vomiting is ceased and her appetite is better, tho' she is still heavy after eating.

I ordered her to increase the dose, but heard no more of her.

3. 1769, *July* 13. A poor man aged 34, had the usual marks of an obstructed Liver, particularly a tension of the hypochondres and jaundice, with a rejection of his food and a vomiting of bile streaked with blood, and an eructation as acid as vinegar.

On drinking the water two weeks the acidity ceased and the tension of the hypochondres was less.

A. D.

4. A. D. 1759. *Jan.* 4. A man aged 48, long troubled with indigestion, vomiting his food, an heart-burn, thirst, bound belly and loss of flesh, at last fell into that deplorable malady the *Miserere mei*. In the preceding part of his disorder he had some relief by drinking our *Francis-street* water, and sometimes taking mercurial pills combined with purgatives; but he had so great an obstruction in the intestinal canal, that the water and all he had taken, after being kept 24 hours or more, were usually rejected by vomit, and at length

Jan. 20, he vomited what by the factor was judged to be his excrements: however he survived till next summer 1760, when he was as it were a living skeleton, nor could he go to stool but by art, and his heart-burn and thirst, with the vomiting continued, when he began to take a pint of *Lucan* water every morning, and withal he took pills of Aloes and Soap. He had not thus used the water a month until he was greatly relieved; his heart-burn was abated, his drink passed by urine, and the reliques of his meat by stool, he got a voracious appetite and grew fat, until

April 3, 1762, when he suffered a relapse, and was advised to repeat the *Lucan* water and clysters, with what event I know not; but thus much may without rashness be affirmed, that
this

this patient was rescued from the brink of the grave, and restored to health during the space of above a year and a half, chiefly by means of this water.

But to proceed, as the Sulphureous waters of *Moffat*, and ours of *Swadlingbar*, have been justly celebrated for their good effects in those disorders of the stomach and bowels, which are commonly confounded under the general denomination of Colics and Heart-burns, our water also from numerous observations appears to have have had very powerful effects in these cases, even such as appeared rebellious to common remedies, and as far as I have hitherto learnt, chiefly where attended with a predominant acidity.

From a considerable number of instances to this purpose, I here select a few, *viz.*

1. A. D. 1764, *August* 19. A middle-aged woman and valetudinary, was subject to lancinating pains in the region of the stomach, with an acidity, especially upon the disappearance of certain red pustules which had long attended her. She was weak, emaciated, and had lost her appetite. She drank a pint every morning, and *Sept.* 10, was much better, and some fresh eruptions appeared on her skin.

2. 1765.

2. 1765. Similar to the foregoing seems to have been that of a young man aged 29, who for three or four years past had been subject to returns of pains in the region of the stomach, with flatulence and acid eructations. He took a quart every morning for nineteen days and was cured.

3. A. D. 1762. A man aged 56, hereditarily of weak bowels, long troubled with indigestion, and a violent pain at his stomach, usually beginning at four in the evening, and lasted till four in the morning with great acidity, and sometimes a watery saline discharge by vomit, with rejection of his food; he was costive, and had an obstruction in his urine during the pains, which commonly went off with the discharge of a turbid urine. He was subject to watery pustules on his skin, peeling off in scales, which when they appeared, he was usually better as to the complaints of his stomach, and *vice versa*.

After having taken the *Magnesia alba*, Gum-pills and Aloes with little advantage, he betook himself to the *Lucan* water, of which he drank a quart every morning during great part of the summer 1763; whereupon the eruptions on his skin returned, but all his internal complaints vanished: he grew fat and passed the following winter in a great measure free from them.

4. A. D. 1760, *Aug. 25.* A young man aged about 30, of a delicate fabric, of a gouty extraction, and from his childhood subject to the Rheumatism, had for a considerable time past been troubled with convulsive twitches and cramps at the region of his stomach, and sometimes with a heavy pain there. Nature ordinarily relieved him by certain fiery, itching eruptions on his skin, which ended in small, scaly exfoliations: also a pain at the toe of short duration had been observed to take off all complaints.

Encouraged by these successful efforts of nature, I ordered him to drink the *Lucan water*, first to a quart in a day, which he took for ten days, upon which the eruption upon his skin became more universal than before, and he was better as to the complaints of his stomach.— He then increased the dose to three pints in a morning, and was ordered to take physic every tenth day; and after that he took four pints in a day till *September 15.* It excited a burning heat in the skin, and a sensation there as of the pricking of needles, with a great sweating in the night, and the complaints at his stomach were much abated, and he passed the following winter much better than usual.

May 31, 1766. A woman of about 46 years of age on the disappearance of the menstrual discharge was seized with an intermitting fever, and

and during the space of two years past became extremely valetudinary, and was strongly threatened by a flow tabes manifested by an inveterate cough, hoarseness and sometimes small abscesses attacking different parts of the body, as sometimes the bowels, sometimes the head, sometimes the urinary passages, and sometimes the chest, with pains and menaces of immediate suffocation.

In this tedious and distressing state, wherein only a little temporary relief was procurable by medicines, and one evil only taken away by the succession of another, in the month of *January* last, when no food stayed on her stomach, her physician (observing some military pustules on the skin, and which were attended with some degree of relief) proposed, in this state of extreme danger, and even in the midst of that severe winter, the use of the *Lucan* water in small quantities, which accordingly she took to a pint, gradually increasing the dose to a quart and sometimes three pints in a day, and with some intermissions, continued it through the months of *February, March, April* and *May*.

It agreed so well with the stomach as not only never to chill it, but was retained when nothing else would stay on it, and enabled her better to retain what light food she was capable of taking, always sitting light on her stomach, excepting only when, by being exposed to the air, it had lost its sulphureous smell, and then

it fat heavy : it had moreover this good effect, that it renewed the miliary eruptions and promoted sweat, which was always attended with relief, and a remarkable alleviation of her distresses, under which she survived and her life was prolonged for some months beyond all human expectation, till the middle of *June*.

Notwithstanding these happy successes attending the use of this water, that it is far from being true that every pain in the stomach attended with flatulence and acidity will give way to it, appears from the following history.

A Virgin aged 30, pale and weakly, had for several years been greatly distressed with a gnawing pain, flatulence and tension in the region of the stomach ; it extended to the ribs on each side, and was attended with a dejection of Spirits, and sometimes she vomited a very acid and pituitous matter.

At the latter end of summer 1760, she drank the *Lucan* water, from a pint to a quart in the morning for a month : it chilled her and the pain became more violent and attacked her earlier in the day than usual.

On the contrary, the *Magnesia alba* relieved her, as did also Milk, with a small quantity of Brandy in it.

It

It were doing injustice to these waters to suppress the mention of their good effects in the Piles, external or internal, often attended with great pain, and sometimes with bloody and other discharges.

From several instances to this purpose, I shall select a few, *viz.*

1. *May 11, 1765.* A young woman aged 30, had for four years been troubled with the Condylomata Ani, attended with great itching and sometimes bloody Stools. She began with drinking a pint in a day, increased the dose to a quart, and at last to two quarts in a day, and washed the parts with the water, and was much better.

2. *August 22, 1765.* A man aged 25, had for several months tumors of the hæmorrhoids, with a discharge of blood and pain. He took a quart of the water daily for a fortnight, and was much better.

3. *A. D. 1764.* A young man with very disordered bowels, and the tokens of a very acrimonious state of the juices, having been long troubled with internal hæmorrhoids, with Tenesmus and bloody stools, was pale, languid and inappetent: at length appeared excoriations in the mouth, gums and tongue, and scabs on the head with a large watery discharge, with some relief.

He

He drank these waters the greatest part of the summer with great benefit, and recovered his appetite and complexion. The Scorbutic Symptoms appeared again slightly in *February*, 1765, and he was advised to repeat the water in summer.

August 10. He has drank a quart in a day with relief : I ordered a double dose.

4. A. D. 1764. *August* 3. A man aged 32; of an highly scorbutic habit, being attended not only with numerous suppurating pustules with great itching, but also with the wandering pains and spontaneous lassitude peculiar to the Scurvy, properly so called, and besides this he had very bad bowels, an enormous flatulence, an habitual Tenesmus, pituitous and sometimes green stools, was usually costive and his mouth dry.

Aug. 15. A Vomit having been premised, and a dose of one of our purging waters (which last exasperated the hemorrhoidal complaints, and no wonder, it being usual for those waters to excite a foreness in ano) he began to drink the *Lucan* water to a quart in a day, gradually increasing the dose to two quarts, and proceeded to drink it till *October* the 8 th. At first it gave him a pain in the head and purged him a little. At this time, viz. *October* 8 th, his Tenesmus is vanished, but the pustules on his legs were in a more inflamed state than usual,
for

for which reason, he was bled, with relief, and then proceeded to drink the waters until *October* 25, when both the Tenesmus and pains of the limbs were no longer troublesome, but the flatulence still continued.

June, 1765. He is in a much better state of health than ever, his complexion more florid and he is chearful, and every complaint much less, tho' he has still some eruptions on his skin, and is advised to repeat the water this summer.

Aug. 1766. Some Eruptions returned last Spring, and he repeated the Water with good effect, and is grown fat, and has better health than usual.

The following Case was communicated by a learned Physician, *viz.*

5. A Lady aged 37, of a very irritable fibre, and often affected with various nervous complaints, was in the spring of the year 1764 sorely vexed with external and internal Piles, from which flowed, at times, a considerable quantity of blood; and sometimes an acrid, scalding Lymph. The pain was so intolerable and constant, that she could get little or no sleep, she lost all desire for food, acquired a cadaverous complexion, and wasted rapidly in flesh; being under the care of a very expert Physician, nothing external or internal was omitted that bade fair for evacuating the sharp juices accumulated

accumulated on the rectum, or assuaging the excruciating tortures they occasioned, but with scarce any advantage to the patient.

At length, late in the month of *April*, the *Lucan* water was recommended to her, which she drank to the quantity of a quart in *Dublin* every morning. In three days the pains remitted, in six or eight they totally left her, and as she could not at that time be supplied with more Water, the Aq. Calc. min. C. softened by a solution of the mucilaginous gums was ordered her; under which she was confirmed in her usual state of health, nor has she (that I could learn) at any time since been troubled with the slightest return of the *Hæmorrhoidal Complaint*. *May, 1765*.

In *hypochondriac* cases, particularly in dejection of Spirits, it has been of signal service, an ordinary effect of it being to raise the Spirits, without inflaming the blood.

Among these I am informed from good authority, of one who every summer, is subject to the return of a Melancholy, or great depression of Spirits, with thirst, much relieved by drinking this water, and the progress of it was prevented in the summer of 1765, by beginning to drink the water early in the season.

A. D.

A. D. 1763. A man, aged 22, happily reclaimed from a life of debauchery by a religious turn of mind, became abstemious, perhaps to a contrary extreme, which, together with an imprudent use of external applications in repelling certain cutaneous eruptions, to which he had been long subject, seemed to have laid the foundation for divers nervous complaints succeeding, *viz.* Tremors, with a sensation of something creeping on his skin, a palpitation of the heart on his first wakening, a slow, unequable pulse, a spontaneous lassitude in the morning, and pain in the head.

He grew worse on the use of a purging water and worse also on bathing in the Sea, and not better on taking the Gum pills.

June 17. He began to drink the *Lucan* water, and continued to take a quart every morning for a month; his Tremors became much less and the pain of the head vanished, whilst the cutaneous eruptions came out afresh.

He continued in a tolerable state of health.
April, 1765.

In Diseases of the Sex, particularly the *Fluor albus*, I am informed of several who had been greatly reduced in flesh and strength, who were restored by drinking this water at the fountain. It shall suffice to give a remarkable instance of its powerful effects in one of the

worst of these cases, from a Physician of character, viz.

In the year 1764, a Lady, aged 32, having for several years the marks of a scorbutic acrimony, particularly small red pimples in the face attended with heat, had been for three years extremely irregular in the menstrual evacuation, generally menstruating every ten or fifteen days and in great quantities; at the end of which time she was attacked with the *Fluor albus*, which became very troublesome, the discharge being so acrid as to excoriate every thing it touched, and so great as to extend to all the neighbouring parts; in this state she drank the water in town, which she herself carefully corked and bottled at the well, to about five pints in the day, for the space of about a month, and was entirely cured of the *Fluor albus*, recovered her appetite and grew fat.

N. B. In 1765 no *Fluor albus* appears, but the pimples remain, and she is about to repeat the waters this second season, which she did, and was cured without relapse to the year 1770.

It has been surmised by some that these and other light Sulphureous waters are dangerous in *Consumptive cases*, but very unjustly, as I am convinced from observation. I shall not indeed take upon me to say that either in the original *Phthisis pulmonalis*, or in that stage of the disease

ease in which Death is the only cure, they are to be recommended, but that they are so far from being a dangerous medicine, that they have been of real advantage in several *Coughs*, accompanied with hectic heats and loss of flesh, I find from positive instances; and where a Consumption may have had a Scorbutic acrimony for its original cause, I believe it might prove a radical cure, which is countenanced by the following Case :

1768. May 28. A man, aged 41, having laboured under an impetiginous disorder 20 years, which 6 years ago was imprudently repelled, and succeeded by an ill state of health, and strong evidences of the *Phthisis pulmonalis*, viz. a pain and weight on his right side, and a discharge of a pint and half of fetid pus by spitting.

In June he discharged blood and pus to a considerable quantity.

July 7. A spontaneous Sweat broke out, together with a fresh appearance of impetiginous eruptions, which relieved him and he gained strength, tho' still some hæmoptoe and the fetid spits continued, as also they did until

August 8, when besides the infusion of the *Veronica mus*, which he had taken some time before, I ordered him to take a pint of this water morning and evening at the fountain.

September 8. He had increased the dose to 6 pints daily at the fountain, for some weeks, and the cutaneous eruptions appeared in more places, with a purulent discharge.

His Expectoration is easier, the spitting of blood less, and the fetor in his spits is vanished. I ordered two quarts to be taken daily.

October 21. Having persisted in the use of the water, he lately had some severe fits as of impending suffocation, followed by a discharge of blood and pus, and grew much better, and can now lie on one side, on which he could not lie before, and the fetor in his breath is vanished, whilst the pustules both on the trunk of his body and on his limbs continue.

He was ordered to take a quart of the water daily: and A. D. 1769, he continues in a much better state of health, tho' still weak in the part affected.

I shall conclude with the good effects of this Water in disorders of the *Urinary passages*, and from undoubted facts shew that, as the remote Water of *Swadlingbar* had long since acquired a just reputation in these cases, that the *Lucan* water is not less efficacious: and this may serve as one instance of the usefulness of Analogy, with respect to the operation of medicines.

Several instances occurred to this purpose, particularly of its good effects in the gravel
and

and expelling small stones, A. D. 1759 and 1761; of a pain in the region of the neck of the bladder in making water, cured by drinking three pints in the morning for some weeks, A. D. 1761: and of pain in making water, with a glairy sediment in the Urine in great quantity, cured by drinking the water during the summer 1762.

But the following instances are more explicit and minute :

April. A. D. 1759. A man, aged 41, was troubled with calculous complaints from his birth, and had been cut when half a year old, and for twelve years past was not able to keep his water five minutes; his urine was slimy, mixed with blood, a purulent matter and gravel: he was greatly reduced by the uneasiness, pain and loss of sleep attending.

Upon drinking two dozen of the water to two bottles in a day, he could keep his water an hour, and *April*, 1760, he could keep it several hours, and continued in this state to *Oct.* 1760. I received no further account of him but that he had an abscess in the *perinæum*, and died consumptive in the spring 1761.

A. D. 1760. A gentleman, aged 45, had a great pain in making water, and an almost perpetual irritation to make it, and was unable
to

to ride, go in a coach, or walk without pain. His urine exhibited a sediment of a cream colour, but without feter, and he had lost his appetite. He took divers medicines for some weeks without the desired effect: upon which this water was recommended to him, which he drank this summer, to the quantity of about three pints in a day, partly in the morning and partly in the evening, for five weeks, upon which he recovered the retention of his urine, and could bear any of the exercises above-mentioned, and withal recovered his appetite, with an improvement of his complexion, strength, and spirits: and upon enquiry *June 21, 1765*, I find that he continued free from the above complaints.

July. A. D. 1765. A man aged about 25, from excesses in riding, drinking and venery, had a Gleet of three years standing, but at present the discharge is colourless and there is no cause for suspecting any remains of a venereal virus; withal he had a severe pungent pain in the *bulbus urethræ*; and four months ago his urine was sometimes streaked with blood, which was cured by Lime-water and the tincture of the bark; but still the pungent pain in the part above-named continued, with an almost perpetual irritation to make water, and after pissing, a burning pain, and sometimes he discharged a kind of inspissated mucus, for which
complaint

complaint his Physician ordered him the Mucilage of Gum Arabic and a dose of lenitive Eleſtuary occaſionally, and withal the *Lucan* water ſent him to a neighbouring country, which he took in the doſe of one quart and then two in a day, for the ſpace of a month, and grew much better.

July 4. he went to the fountain, and perſiſted in the uſe of the water.

July 9. he can retain his water half an hour, and has very little pain before or after making it. *30.* He has lately drank two quarts in a day and is better. *Aug. 28.* perſiſting in the uſe of the water he can retain his urine two hours.

A. D. 1767. A real Ulcer of the Bladder being attended with not only a mucus, but purulent diſcharge, was cured by drinking this water.

I ſhall conclude with the hiſtory of a caſe which deſervedly has given great reputation to this water.

A. D. 1759. A gentleman, aged about 50, had an habitual ſweating on the palms of his hands, upon the drying up of which, a white Scurf covered them and his thighs, attended with a great itching. He began the uſe of the water this ſummer, drinking at home two
quarts

quarts in a day : it gave him a vertigo at first, and the white scurf came out more : he continued it six weeks and was cured.

1760. Whereas he had been afflicted with the Asthma four winters before, he had no asthma the last winter succeeding the use of the water ; but he had some return of the Scurf on the palms of his hands this summer, but to a less degree, and his skin was softer. He repeated the water, still at home, but it did not agree with him so well as before, the summer being cold.

Nov. 1761. After a feverish disease of the intermitting kind, and a slight stroke of a palsy in one arm and hand, he was seized with a disorder in the neck of the bladder, with an irritation to make water every ten minutes, and a pain and burning heat immediately after drinking, except of the mildest liquors, as milk and water, or ptisan ; but his customary drink (Claret) he could not bear in the smallest quantity, without exquisite pain, and an immediate forcing to make water : he had every day for three or four hours a suppression of urine : he could not walk without pain.

In his urine appeared, not that glairy matter observed in calculous and other cases, but a kind of thin, greenish pellicle or crust, and sometimes a substance like bran floating in it. He took various medicines ordinarily prescribed in these cases, but all in vain.

1762.

1762. In *July* he went to the fountain, and drank the water from two to three or four quarts in a day, for four months, upon which the suppression of urine ceased, the intervals between making water were longer, and the burning heat after drinking less, and he could walk without pain, tho' he still had great pain by times, especially before the discharge above-mentioned, which was very large during his use of the water.

During this season, in about six weeks after his beginning to drink the water, an Eruption appeared over all his body, which was attended with inflammation, suppuration and great itching. He persevered, even in the following winter, in drinking the water to two quarts in a day, and observed that, on drinking it during the time of his violent pain, he had less irritation to urine than by drinking so much milk and water.

From *November* to *February* he had nothing of the above-mentioned discharge in his urine, and he could retain it almost the whole night, altho' he had still a little pain after making water,

In *May*, 1763, on being seized with an inflammatory cold, the foul urine returned with pain, which vanished on his pursuing the use of the water : and he returned to the fountain again, and drank from three pints to two quarts

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in a day, and was able to drink above a pint of Claret in a day with impunity, and could retain his water as in health, and was in better health than for nine years past; and what is remarkable, upon his recovery, the white Scurf on the palms of his hands returned again, tho' not to so great a degree.

March, 1764, he still continued the use of the water to a quart in a day; and on catching cold and some irregularity, had some returns of the foul urine and pain, but which soon vanished upon an increased dose of the water.

April, 1765. He has continued the use of the water, having not only drank it at the fountain last summer, but in winter frequently, to two quarts in a day, and usually at this time drinks a bottle of Claret in a day: he had lately some returns of urinary complaints, but the use of the water for a week took them off,

Such were the excellent effects of a steady and invincible perseverance in the use of the water, thro' a series of years, and mostly at the fountain: and on this occasion I shall beg leave to subjoin the respective diagnostics of an Ulcer of the bladder and of an Ulcer of the kidneys, as of use and importance, and which may prevent disappointments with regard to the success attending the use of these waters, viz.

“ Ubi Renis ulcus supra modum fordescit, & in fistulam abit, in urina alba, crassa atque fetida sepe

sepe crassamentum quoddam subsidet viscidum narium muco aut oui candido non dissimile."

Crassior pituita instar mucī narium matulæ fundo inhærescens cum dolore emissa, Vescæ calculum aut cervicis sordidum ulcus denunciat; at quæ nullo dolore fluit, e crudo Renum aut circumpositarum partium ulcere vel abscessu illabitur." Fernel de Urinis.

Now where this glairy discharge has been attended with pain, and frequent irritation to make water, and consequently where the seat of the disease is the Bladder, and likewise in what is called the *Scabies Vescæ*, which the same Author and *Hippocrates* (A) describes to be attended with a discharge like bran, and [without fetor, here I have observed the sulphureous waters of *Swadlingbar* and *Lucan* to be effectual, but in the glairy discharge without pain I have been disappointed in my expectation in the use of the *Swadlingbar* water, and of one of the strongest of the *Chalybeate* waters in this kingdom, tho' both were drank at the fountain,

As in the preceding account I have endeavoured to do justice to these waters, with regard to their virtues, I determined also, in order to act the part of a faithful historian, not to omit an account of their abuses, and of any

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mischief

(A) Aphor. 77. Sect. 4.

mischiefs they had done : and indeed the great number and variety of cases in which, during these eleven years they have been used, with and without advice, considered, it were not to be wondered, if a large catalogue of the mischiefs they had done should be produced ; and accordingly I carefully minuted down any instances that might occur to this purpose ; but indeed these appeared to be very few, an argument of their great safety as a medicine : Some of these few I have already interspersed, and shall here add a few more.

1. A man, aged 19, had for four years been troubled spring and fall, with a disorder resembling an inveterate Itch.

Having repeatedly taken one of our purging waters with Glauber's Salt,

June 5, 1767, he took a quart of the *Lucan* water every morning till June 18, whereupon the itching was increased, and he had an hæmorrhage from the nose ; wherefore he was bled and then took the water to two or three pints daily.

July 3. The itching was increased, but he received more benefit by bathing in the sea, and the use of an ointment of *flos sulphuris* and hog's lard.

2. March 11, 1767. A Girl, aged 15, always habitually very flatulent, and formerly troubled

troubled with cutaneous eruptions, which retiring, were succeeded by pains of the stomach and rejection of her food, whom therefore I imagined to be a proper subject for this water, but the event shewed I was mistaken : for upon repeated trials made of it, both alone and aromatized with ginger, at different intervals, during the space of three months, it always chilled her : nor indeed was the use of divers other medicines prescribed her more successful.

3. The next case is indeed not an instance of want of good success in the use of this water, but suggests the necessity we are not unfrequently under of varying our medicines, in the cure of stubborn disorders.

A. D. 1763. A young man, aged about 28, was troubled with a pain at his stomach; returning annually in the summer, and attended with flatulence and acidity.

He took Rhubarb and the *Magnesia alba*, with temporary relief, but on drinking this water to a quart in the morning for a week, the good effects were greater and more lasting.

However, his disorder returned, as usual, the two following summers, and he was temporarily relieved by other medicines, particularly in the year 1765, but not cured until he had taken 36 quarts of the Water.

In

In the spring 1766, the pain of the Stomach returned and was removed by drinking Tar-water to half a pint morning and evening, and indeed more expeditiously and effectually than by the *Lucan* water; for he continued free from it to any degree, for three years after.

4. A. D. 1760. A valetudinarian, of a gross and highly scorbutic habit, and who had frequented divers other mineral waters, came hither with an inveterate ulcer in his leg, with tumor, inflammation, and small discharge: he drank the water in great quantity, and washed the part with it (prematurely, as it is said, and that he was otherwise irregular, and that the Ulcer was dried up) which was followed by certain internal disorders, from which he emerged with proper medical assistance, not without danger of his life.

5. A man, who from the symptoms, was judged to have an abscess in his liver, and abandoned as incurable by his physicians, died soon after drinking this water.

6. A. D. 1759. A man, aged 62, voided a stone on drinking this water, and withal, having found benefit from it in a thirst and loss of appetite, which had attended him, grew excessively fond of it: but his age, and withal,
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an habitual coldness in his hands lately observable, considered, he was cautioned not to be too free with it, but to take a pint of Claret daily, during the use of the water, which he neglected to do, but continued to drink it for two months, viz. to the 12th of *August*, when he found it to chill him, and left it off: he then fell into a general *Anasarca* and a slight diarrhæa, grew sleepy and died apoplectic, *September*, 1759.

1. A. D. 1759. A man of a gross habit and hydropic disposition, of which he was pretty well recovered, but as the use of this water began then to be modish, he drank it for six weeks, when he began to swell again, and left it off, fell into a flux, which at that time was epidemic, became emaciated, and died six weeks after his leaving off the water.

Now the ill success attending the latter of these cases, seems to have been owing to the want of proper advice, or acting contrary to it: a few such cases might have blasted the reputation of this inestimable spring for ever, had not they been confronted by such a multitude of indisputable instances of its good and powerful effects.

C O-

C O R O L L A R I E S.

1. The operation of this water in the cases before related, was principally by Urine, sometimes by sweat, and tho' it ordinarily binds the belly, there are frequent instances of its purging a little. On the whole, it acts as a diluent, cooling, demulcent, diuretic, diaphoretic, balsamic and healing medicine, and is remarkable for determining the humours powerfully to the surface of the body, as appears by the numerous instances of pustules thrown out by it in the above cases, to the relief of the patients.

2. It is not only an extremely soft water, as containing very little salt of any kind, but what it does contain is chiefly of the alkaline kind, but it manifests, even to the eye, in common with other waters of the same kind, that white, glairy, bituminoso - sulphureous matter, which is deposited on the grass in its current, which is a mineral balsam adapted to take off irritations from stimulating sharp humours and heal excoriations; and moreover, beside these ingredients, it is also impregnated with some very subtil, volatile, active parts, which affect the brain with a sense of giddiness, sometimes heaviness or sleepiness and sometimes pain, as from a slight intoxication; these give activity

vity to the element, and to the more fixed parts.

3. The operation of medicines is far from being altogether certain: there are some idiosyncrasies which are discoverable only by experience, and of waters of the same kind, one shall agree with some Stomachs, when another shall disagree with them: and as our bodies frequently change, the same water sometimes is observed to affect us differently, in different seasons; but from numerous observations it appears that this water very rarely chills the Stomach, and has been experienced to agree with the gouty, and is particularly eminent for creating appetite and helping indigestion, on which account it eradicates all those diseases which proceed from this cause, and is one reason of its raising the Spirits.

4. That this water is of a balsamic and healing quality, in external and internal applications, is demonstrable to the eye in the cures above related, particularly of the *Herpes exedens*, scorbutic ulcers, and excoriations in the legs, arms, mouth, gums and other parts, in cutaneous and leprous disorders moist and dry, in the inveterate Itch and diseases like it; in which cases it cleanses and heals, cools and corrects the acrimony of the humours.

5. It cures cutaneous disorders and ulcers which do not give way to Mercury (a course at the same time far more agreeable) and so it comes most seasonably to our aid in the cure of those stubborn diseases, the Scrophula and Scurvy, in both which experience has convinced us of the inefficacy, not to say injury of mercurial medicines.

6. As one of the most ordinary operations of this water is, to determine the humours powerfully to the surface of the body, it promises good effects upon the retirement of the arthritic, scorbutic or other morbid matter, from the surface to the *viscera*.

7. The Case, No. 4, p. 242, above, and that p. 228, 229, are two manifest instances of an accumulation of ferous sharp humours in the blood, for want of a due discharge of them by their proper emunctories, the kidneys and bladder, which discharge being restored effected the cure.

8. More seasons than one are necessary to eradicate inveterate disorders, and withal, a due regimen, as to diet and other non-naturals, and sometimes evacuations, and the assistance of other medicines ought to be premised and interposed, with proper advice, which, if observed, I might perhaps, safely prognosticate that the credit of this water will prove at least far more
or

or as long-lived as that of *Tar-water*; a medicine which if once too much cried up, is now perhaps too much neglected; and as many of the Facts that have been related of it are very well vouched, and the recommendation of it had its rise in this kingdom, I apprehend it may not be impertinent to make a short Comparison, 1st, between this and the celebrated waters of *Aix-la-chapelle* and the baths of *Bareges*; and 2^{ndly}, between *Tar water* and *Lucan water*, as tending to confirm and illustrate the operation and virtues of each.

First: Tho' it differs from the celebrated Waters of *Aix-la-chapelle* and the *Bareges* waters, in that ours is cold, the others hot; it agrees to them in other respects, as 1. In the smell. 2. In the saponaceous quality. 3. In the evidences of an impregnating sulphur both in the water itself, and the spontaneous precipitate. 4. In continuing mostly clear or nearly so with Alkali's. 5. The impregnating salt in each of them is the native Alkali combined with marine Salt. 6. Their Virtues in internal use, appears from experience and observation, to be in a great measure similar.

Secondly: The *Tar-water* is water impregnated with the more subtile and volatile parts of a vegetable Balsam; the *Lucan*, is a water impregnated with a mineral Balsam, being a

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subtile

subtile Sulphur and mineral Oil or Bitumen, both which are respectively precipitated from them by the addition of a few drops of the Solution of Silver.

2. In the *Tar-water* a subtile Acid is obvious to the taste, in the *Lucan water* rather an Alkali, being a very dilute solution of a substance resembling the *Hepar Sulphuris*: for tho' a certain volatile sulphureous Acid, may be allowed to be an ingredient in most or all mineral waters, this is soon dissipated by the heat of the body.

3. The operation of the *Tar-water* is for the most part by urine, sometimes by sweat, rarely by stool or vomit, and a very frequent effect of it is, to throw out pustules on the surface of the body, to the relief of the patients: it raises the Spirits without either inflaming or leaving that depression which is the ordinary consequence of drinking Spirits: and the operation of our *Lucan water* is found to be altogether similar, in all these respects.

A like Similarity appears also in the effects of these waters, in the cure of many stubborn diseases, not giving way to the productions of Pharmacy: for the following facts related, concerning both, are undeniable, *viz.*
that

that they are eminent in restoring lost appetite and digestion, and consequently in the cure of those numerous diseases, which proceed from this cause; *v. g.* want of sleep: in curing stubborn pains of the stomach and bowels: in healing rebellious Ulcers, whether of the impetiginous, scorbutic or scrophulous kind, by internal and external use.

DUBLIN, 11th, 7mo. 1770.

A P R E.

A P R E F A C E

Shewing the Importance and Usefulness of Histories of the Weather.

AS divers persons have of late years published Histories of the Weather, perhaps one from a considerable city in this kingdom, containing a longer series of Observations in one place than often falls to the lot of an individual to make, may merit a place among the rest, and would probably find more readers if one could shew the real usefulness of such undertakings, for which purpose the following Observations are premised.

I must own that the Variableness of the Winds, Weather and Seasons (common not only to us and *England*, but to other places without the Tropics, in the temperate Zones, where also is the greatest variation of the Barometer, particularly in the latitude of 45, and about 10 degrees on each side), is so great that it is probable an attempt to discover any regularity
in

in their succession, will be ridiculed as equally practicable and useful as fixing a Sun-dial on a Weather-cock: and indeed it must be acknowledged that there are truly many Anomalies in these appearances, of which I am far from presuming to give a satisfactory solution, some of which I shall here mention as Problems, to exercise men of superior genius and leisure, viz.

Why do not only different days of the same month and different parts of the same day, but the same month exhibit very different sorts of weather? v. g. tho' *January* be usually the coldest and *July* the hottest month in the year, yet in some odd Seasons, *February* appears by the Thermometer to be colder than *January*, and *August* hotter than *July*, and *September* hotter than *August*: and, more extraordinary than this, Dr. Short, in his *Chronological History of the Weather and Seasons*, remarks, that from *December 10*, to *December 30*, 1697, it was as hot as *August*, and that the Thermometer in *December*, 1713, was as high as it is mostly in *May* or *June*; and that in 1700, *November*, *December*, *January*, *February*, and *March*, were all warm, pleasant Sun-shine like Summer (A).

Neither

(A) That there are sometimes Effervescences in the Atmospheric Fluid surrounding us, besides the Commotions attending thunder, lightning, and some other Meteors, appears from the
great

Neither does there appear less difficulty with respect to the succession of. sometimes a series of dry, and sometimes of wet years: and, to make all the concessions that invidious critics might desire, as to winds, and the respective weather attending them, tho' it be a general and very useful Observation, that our S. and S. W. winds bring rain, and winds, and our E. dry weather, yet it not unfrequently proves far otherwise; for though our calm and pleasant Summer-weather be commonly attended by E. and S. E. (s) winds, yet frequently great gluts of rain and sometimes storms are attended with winds from those two points, and the S. though generally wet or moist is sometimes attended with fair and pleasant weather, and the S. W. though generally wet and windy, some-

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times

great Heat several times noted in the following History preceding great Storms. Perhaps something of this kind from hidden effluvia might have attended those uncommonly warm winters.

(s) Is there not an evident condensation of the Atmospheric Fluid in those cases frequently noted in the following History where, with abundance of moist Vapors manifested by a heavy hygrometre, a high Barometre also attends? which moist Vapors coalescing into larger molecule frequently fall in rain? and as we often see contrary currents in the air, may not a N. and an E. or S. E. wind, meeting with another from the W. and S. W. and uniting to it, and at length prevailing over it, produce such a condensation and consequent rain? That the S. E. winds should be attended with rain, is no wonder, from the neighbourhood of the Irish Sea and St. George's Channel.

times proves fair and pleasant, and sometimes frosty, (c) the W. though often windy, and sometimes wet, (though commonly not much wet,) hath been attended with rain all day, and sometimes frost. The N. tho' generally cold, and often clear, is sometimes attended with lasting rains, The N. E. commonly cold, in summer fair and hot, is sometimes attended with plentiful rain, and sometimes tho' rarely with high Wind. The N. W. often fair, hot in summer, sometimes frosty, and has sometimes been attended with wet weather.

Now, amidst all this intricate and perplexing variety of appearances, are there absolutely no stated periods at all to be observed with respect to

(c) Perhaps our Mountains to the South frequently covered with snow, may give us cold with the S. W. wind, but in as much as it abundantly appears from many observations in the following History, that the very same state of Weather with respect to either great heat or cold, great dryness or moisture, great frosts and deep snow, Floods, and often great Storms, and sometimes Fogs, often obtain here, either at the same time as, or a little sooner or later, than in *England*, and even in divers remoter parts of *Europe*, these appearances are not to be attributed to any neighbouring Lakes or Seas, but to some common remoter cause, not indeed to the Moon or to the planet *Saturn*, as the Astrologers idly dream, but rather chiefly thus in a summary view, our cold from the grand reservoir of Snow and Ice in the N. and N. E. parts of *Europe*, our heat from the air waisted by the S. wind from the regions warmed by the Sun, our drought from the *Continent*, our wet Weather chiefly by the S. W. winds from the great *Atlantic Ocean*.

to winds and weather? Is there no character or description proper to each month and season with respect to the weather and winds for the most part obtaining? Lazy men will readily pronounce there are not; but those who have diligently attended to these operations in nature, will scarcely give up as Chimerical all attempts to discover something regular and periodical therein, although frequently interrupted, nor despair of deducing from a careful collection of facts, some Conclusions of importance and use to the Mariner, Husbandman, Philosopher and Physician. For

1 st. We observe in a calm summer's day not disturbed by vapors, there is commonly a kind of Trade-wind, which seems to depend on the motion of the Sun, viz. a gentle breeze from the E. by day, and from the W. at night. This is confirmed by *Pliny* and *Seneca* cited by *Dr. Gill*.

2. It also holds here as well as in *England*, that there is a periodical return of N. and E. winds in Spring.

3. As the heat of Summer exhales the greatest quantity of Vapors, and dissipates them, the condensation of these Vapors proper to Autumn is thus justly described by *Thomson* on the Seasons:

N n 2

Now

Now by the cool, declining year condens'd
 Descend the copious Exhalations check'd,
 As up the middle sky unseen they stole,
 And roll the doubling Fogs around the Hill.

And his description of Winter, is not less just than poetical, *viz*,

————— fee Winter comes
 Sullen and sad with all his rising train,
 Vapors and clouds and storms—the sun
 Scarce spreads o'er æther the dejected day,
 Faint are his gleams and ineffectual shoot
 His struggling rays in horizontal lines
 Thro' the thick air
 Weak, wan and broad he skirts the southern sky.

This is perfectly agreeable to the Observations in the following History, that storms are the proper attendants of Winter, and particularly of *November, December, January, and February*; and therefore how justly soever the phenomena of the Trade-winds may be solved by the heat of the Sun rarifying the Air, our Winds, especially Storms, seem not to be owing to that cause, but to Vapors; which is further confirmed from hence, that we have the same winds in the night as the day, and that storms are generally accompanied by a cloudy sky, and that after a storm there commonly succeeds a remarkable serenity.

4. The

4. The indefatigable Dr. *Short*, in the Appendix to his excellent *Observations on the Bills of Mortality*, has presented the World with a most laborious and inestimable collection of the state of the Winds and Weather, during a long series of years, from divers parts of *England*, and therein struck out divers valuable hints towards establishing some Conclusions of importance in this intricate affair, which I have here endeavoured more minutely to prosecute and improve, *v. g.* he has given the ordinary monthly course of the Winds in *England*, in a series of 34 Years thus :

July has most N. W. wind and least S. E.

May, least N. W. and most N. E.

July, November and December, least N. E. *April* and *May* most.

March and *May* the most N. *June* and *July* the least.

July and *August* most W. wind ; *March, Jan.* and *October* least.

October and *December* most S. *April* and *July* least.

April and *May* most E. *January* and *November* least.

November, July and *September* longest, S. W.

March, April and *May*, shortest.

April and *December* most S. E. *June* and *July* least.

So far Dr. *Short*.

With

With us at *Dublin* the state of the reigning Winds in the several seasons during 43 years, has been as follows :

The S. W. reigned least in Spring, a little more in Autumn than in Summer, and most of all in Winter.

The W. winds blew least in Spring, and less in Winter than in the Summer or Autumnal quarter.

The N. W. blew least in Winter, but the S. most in Winter.

The S. E. most in Spring, least in Winter.

The E. by far the most in Spring, next in Summer, next in Autumn, and least of all in Winter.

The N. E. most of all in Spring, and least in Winter.

The N. most of all in Spring, and least of all in the Winter quarter : But more particularly, as to the state of the several months thus much appears, as far we may be safe in drawing conclusions from the Observations of 43 years, that

In *March*, with the opening Spring, far otherwise than in *February*, the Winds from the N. and E. points begin to gain the ascendant over the Trade-winds of the Country, the W. and S. and this predominance of the N. and E. winds becomes greater in *April*, and still greater in *May*.

In

In *June*, with the opening Summer, our Trade-winds, viz. the W. and S. come in play, and begin rather to gain the ascendant over the E. and N. and this prevalence of the W. and S. winds, becomes much greater with the advancing Summer, being near double to the E. and N. in *July*, and rather above double in *August*:

Moreover, *July* is considerably wetter than *June*, but *August* is the most Summer-like of the three.

In the three Autumnal months, the ascendancy of the W. and S. Winds over the E. and N. is still maintained, and especially in *November*, which exhibits above treble of the first to the last, and with the further declining Sun much more storms than *October* or *September*. *October* with us, at a medium, is a drier month than *September*.

In the three Winter months the ascendancy of our Trade-winds, the W. and S. above the E. and N. is strongly maintained, the two first being for the most part above double, and sometimes treble to the last: and the S. W. in particular have the predominance; and *December*, *January* and *February* are the months proper to Storms, and were so with the advancing Season, even more than the month of *November*, and much more so than either of the Equinoctial months, *September* or *March*.

The

The above Observations are the result, not of vague and loose conjectures, but of faithful and laborious Observations of the occurrences in each month and season for a long series of years, and of the method I have taken in the ensuing treatise, as the only one whereby such Observations can be rendered of use, in order to draw the proper conclusions from them, viz. by digesting the occurrences with regard to the weather and winds of each Month and Season, and presenting them at one view in Tables constructed from the preceding histories, without which assistance no ordinary memory were sufficient to keep in view the state of each month or season: so that I apprehend such a method absolutely necessary in the natural History of any Country, in order to give a just account of the real nature of the Climate, both what it is, and what we are to expect from it; and withal from a like Collection and disposition of like Histories from *Great-Britain*, to institute a Comparison between, and give the distinguishing character of each climate; but more particularly, faithful histories of the Weather and Seasons, with proper Observations thereon, may be of great use, in the language of the Poet

————— to vindicate eternal Providence,
 And justify the ways of God to men;
 in tracing the footsteps of divine Wisdom and
 Goodness, presiding over these seemingly irregular

gular operations in Nature, and to render them a subject rather of adoration than of discontent and repining, as they sometimes are, in the too frequent, not to say wicked exclamations we hear against the inclemency of the Climate, our changeable, and particularly our moist and windy weather, an inversion of the Seasons, &c. which are owing to a want of a due attention to this branch of natural history; for those changes are common to us and other countries alike situated; and it is vain and absurd for us to expect here the hot and dry summers proper to our neighbours on the Continent; or the regular *former* and *latter* Rains, we read of in the holy Scripture (D); and it appears by registries kept even near *London* for above forty years, that not much more than one half of their Summers were hot and dry, and the rest either wet or windy, or had only a serenity frequently interrupted by winter-like weather; no wonder then it should be very rare for us to have a series of hot and dry weather, even in summer, which when it does happen we are agreeably surprized; and it is what the Farmer ought not to expect, but

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provide

(D) In *Judæa* and other hot Eastern countries they have very little rain in the Summer-season, but for the most part their former rain in Spring, a little before or about Seed time, and the latter rain a little before Harvest, when it revived the corn and filled it; and when these failed, a scarcity followed.

provide for the contrary ; and, as a strong instance of uncertainty in our crops, it hath happened, even after a good season of the Corn coming to due maturity, that it has been all spilt by a violent Storm, as was the case here in *August*, 1744. Such accidents ought to rouse our vigilance, and teach us the wisdom of the Bee and Ant, in laying up in a good Season, some provision against a bad, — a lesson, perhaps not more necessary to any Nation than this.

But to return to the groundlessness of our complaints in relation to the weather : it is a just Observation of the above cited Author, and to the glory of God's Providence, that the Winds which are by far the most frequent, particularly the S. and S. W. tho' commonly attended with rain and storms, are also by far the most wholesome, or the least productive of diseases, and the changeableness of our Weather, tho' attended with a few colds, may, upon the whole be deemed a peculiar advantage to us, because the excess of any one quality of the air is tempered by an opposite one, as of cold by heat, of dryness by moisture, commonly and quickly succeeding each other, and preventing those ill effects which any one quality long prevailing might otherwise produce ; and whatever may be said of the coldness and moisture of our Summers, I have
shewn

shewn our peculiar privilege of being more exempt from the E. and N. blasts than our neighbours.

On the other hand, the winds may also perhaps be considered as instruments of divine Vengeance on nations: for something like this seems to be implied in the following notable passage of the divine Writings: "I saw four Angels standing on the four corners of the earth (to whom it was given to hurt the earth and the sea) holding the four winds of the earth, that the wind should not blow on the earth, nor the sea, nor any tree" (E). On which occasion I cannot but call to mind that memorable and unusual Suspension of our soft, endemial or Trade Winds of the W. and S. W. attending the great Frost in 1739 and 1740, with the great Mortality ensuing (insomuch that it has been computed that there died in *Ireland* near 80,000, of Famine or Diseases in that season) as an incentive to a just adoration of that Supreme Being whose high prerogative it is to bring forth the wind out of his treasures (F).

Next, a History of the Weather and Seasons for a series of years, will be useful to Physicians and Philosophers to have recourse to

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{E} Rev. vii. 1—2.

{F} Psalm cxxxv. 7.

in their reasonings on those subjects, and the effects of the air and weather with respect to Diseases and other appearances in Nature within that time; and if registries of the concomitant prevailing diseases were annexed to them and continued thro' a due series of time, we might be enabled by analogy to form some probable conjectures concerning future epidemic diseases.

Lastly, faithful Histories of the Weather and Winds are the only effectual method of establishing or refuting many vulgar traditions, *v. g.* some Astronomers have imagined that, according to the revolutions of the Sun and Moon and other planets, a total Revolution also of the Weather might happen in nineteen years; but Observation shews the groundlessness of this conceit; for the great Frost in 1683, was not followed by an equal one until 1708, 1716 and 1739.

The public are indebted to Dr. *Short* for shewing that neither Comets nor Earthquakes are to be considered as the causes of Epidemic Diseases; he is indeed in some doubt about Eclipses; but I have endeavoured to clear up that doubt, at least in relation to the Weather, in the Sequel, and by numerous Observations abundantly confirmed his hint in relation to the vulgar Error of great Rains attending the Equinoxes: and shewn that Storms are
far

far more frequent at other times of the year : and to conclude, as my first design in keeping a Diary of the Weather, was to find how far the Moon had or had not an influence thereon, and agreeable to Lord Bacon's recommendation, how far the commotions of our Atmosphere in Storms were influenced by the Moon, as the Waters in the Tides, which a Physician of great eminence took for granted, when he wrote his book, *De Imperio Solis & Lunæ* : Whether this be mere speculation, nothing but the method of Induction from a competent number of facts can determine, which I flatter myself is executed to satisfaction, in the following Histories.

Advertisement.

1. I Have begun my year with *March*, as being, notwithstanding our alterations of Style, still the first Month of the Spring Quarter, and *January* and *February* the two last of the Winter Quarter, and agreeing nearest in temperature to *December*, which I reckon still the first month of the Winter quarter, and so *February* with me terminates every Year, and
Jan.

January and *February* instead of being the two first months of any given year, are the two last of the same year with me.

2. My Hygrometre is a Sponge dipped in brine and dried, which is an excellent magnet in respect to the moisture of the Air, varying in weight near 200 Grains.

3. It is to be noted that, as my Observations were made for the most part in the city of *Dublin*, the accounts of Frost and Snow are too little and less frequent than if they had been made in the Country.

4. The points of the Compass whence the winds blew, are not subdivided into more than eight, and even those only conjecturally described, not with precision, which perhaps is not necessary, nor in our situation practicable, where our long range of mountains extending from S. E. to S. W. may sometimes reflect the current of air and produce an eddy.

5. It seems to be for the same reason, viz. our Situation in *Dublin* near the said Mountains, that in general we have more Rain than other places of the kingdom not so situated, the mountains intercepting the clouds.

It



It seems not improper in this place to premise an Apology to one class of my readers, with whom I agree in sentiment, that the Heathenish appellations of the Months ought to be rejected among Christians, could we once be so happy as to be all of one mind; but, in the mean time, as my Labour is intended chiefly for the use of Strangers, I seemed to be under a kind of necessity for their sakes, of retaining the vulgar Appellations, in order to render myself intelligible to the greater part of my readers.

For, on the one hand, had I, according to the Old Style, called *March* the first month, (which indeed seems to be the most natural appellation, and most becoming a Naturalist, as being the beginning of the Spring of the year) I had perplexed my readers in violating the Act of Parliament, which makes the Month of *March* the third Month of the year, and on the other hand, had I conformed to the Act of Parliament, in calling *March* the Third Month, and consequently *September* the Ninth and *October* the Fourth: I should also have puzzled my readers in endeavouring to reconcile calling Seven Nine, and Eight Ten: Wherefore I hope I may be indulged under our present circumstances, in the use of this Liberty.

A Monthly

A Monthly Registry of the Weather and Seasons in DUBLIN, from 1716, to 1724, inclusive :

Chiefly from my own Observations,
joined to those of ISAAC BUTLER,
Author of an EPHEMERIS, and from a
CAREFUL OBSERVER.

1716.

S P R I N G.

March.

THE first ten days frequent frosts,
the rest of the Month cloudy,
fair, and sometimes rain. Wind high
3 days. The principal Winds N. W.

April.

Fair weather mostly, rain some-
times interspersed : hot sun-shine from
20 to 26, and great dews. The
principal Winds S. E.

May.

Alternately fair, cloudy and wet :
high Winds 7 days. The principal
Winds chiefly N. E.

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SUM-

Registry of the

S U M M E R.

June.

Alternately fair and hot, cloudy, and sometimes rain and concluded cool. The pr. Winds N. W.

July.

Fair weather, but interrupted by frequent rains, very hot 4 days : high winds 4 days. The pr. Winds W.

August.

For the most part fair and pleasant, especially from the 20th, to the end. The 11th, a tempestuous night, the Wind S. E. and continued the 12th. The pr. Winds W. S. E. and S. W.

A U T U M N.

Sept.

Very wet, and violent Storms, scarce a day fair. The pr. Winds S. W. and N. W.

October.

The stormy weather mentioned the preceding month continued at intervals thro' this, and cloudy, rainy weather prevailed. The pr. Winds S. W. S. E. and N. W.

Novem.

Cloudy, wet, and frequently windy : frost 3 days, and at the end. The pr. Winds S. E. N. W. W. and S. W. near equally.

1716. 1717.

W I N T E R.

Decem.

Very frequent frosts thro' the month and sometimes snow and hail ; rain also frequently interspersed : high winds 11 days. The pr. Winds N. W and W.
Fre-

January.

Frequent frosts thro' the month, and showers, sometimes of hail : sometimes windy. The pr. Winds S. W. and S.

February.

The first 8 days frosty, with S. E. Winds, sometimes boisterous ; the rest of the month cloudy and wet for the most part. The pr. Winds S. E.

S U M M A R Y.

The Spring variable.

Summer mostly fair.

Autumn windy, stormy and wet.

Winter frosty.

O B S E R V A T I O N.

Storms equal to those in *September*, were scarcely remembered by the oldest man living.

1717.

S R I N G.

March.

Fair and frosty the first six days, then cloudy, wet and windy ; some showers of hail and snow, some frost, a few fair days, and one or two hot : 16 days high Wind. The pr. Winds N. E. and S. W.

April.

Alternately fair and warm, cloudy and showers, some of hail ; also very windy for 16 days. The pr. Winds S. W. and N. W.

P p 2

Hot

May.

Hot and fair mostly : some clouds and rain : The 17th and 18th rain most of the day : high winds the 1st and 27th. The principal Winds W.

S U M M E R.

June.

Frequently hot and fair, but with interruptions of cloudy, rainy, and sometimes misty weather. The pr. Winds W. and N. W.

July.

Showery at the beginning : from the 9th to the 20th very hot, and dry with E. Winds, which did great damage. The remainder of the month cloudy, with some rain. The pr. Winds E.

August.

Mostly fair and dry, and the pr. Winds N. E. E. and S. E. at the end of the month great dews equivalent to rain. The 1st, 16th, 17th, rain most of each day. The 23d and 24th stormy.

A U T U M N.

September.

Variable, often fair, sometimes cloudy and wet, sometimes windy. The pr. Winds W. N. W. N. E. and S. W.

October.

Often fair, sometimes cloudy, wet and stormy : a little frost toward the end of the month. The pr. Winds S. E. and S. W.

Novemb.

Cloudy, much rain and often windy : some few frosts. The pr. Winds S. W. and S. E.

W I N-

1717. 1718.

W I N T E R.

Decemb.

Cloudy, wet and windy, sometimes frost : a little Snow from the 15th to 24th : pleasant and fair for the Season. The pr. Winds S. W. and N. W.

January.

Frost thro' great part of the month, and some Snow ; else cloudy and wet, and a few days fair. The 23d windy. The pr. Winds N. W.

February.

Fair weather for the Season, tho' cloudy and showery at times, and often windy. The pr. Winds S. W.

S U M M A R Y.

The Spring variable.

Summer hot and dry.

Autumn variable.

Winter variable ; sometimes windy, sometimes frosty.

1718.

S P R I N G.

March.

Alternately fair and cloudy ; some rain, and a little hail and snow. Wind high the 1st, 4th, 17th, 18th, 19th, 22d, 31st. The pr. Winds S. W.

April.

Alternately fair, cloudy and showery thro' the month, save that from the 20th to the 26th it was violently

May.

ly hot. Wind high the 12th, 24th.
The pr. Winds N. W. and S. W.

Fair and pleasant frequently thro'
the month, sometimes rain and a lit-
tle wind. The pr. Winds S. E.

S U M M E R.

June.

Fair and pleasant, but not without
clouds and showers; the 19th rain
all the day. The pr. Winds S. E.
and W.

July.

Frequently hot and fair, as in the
preceding month, but more rain and
wind, particularly great rains the 23d,
25th, 27th. high winds the 15th,
20th, 20th, 26th. The pr. Winds
N. W. S. E. and W.

August.

Fair and pleasant mostly, but some
rain and clouds. High Wind the
7th, great rain the 28th, at night.
The pr. Winds S. E. N. E. and E.

A U T U M N.

September.

For the most part fair, particularly
from the 7th to the 23d inclusive,
hot and dry, the like not known in
the memory of Man. The Winds
during that season S. E. and N. E.
but from the 24th to the end W.
and S. W. which brought rain. The
27th Wind pretty high.

October.

Frequent rains and sometimes winds;
the 7th, 9th, 10th, stormy; the 16th,
17th, 18th frosts: from the 23d to
the

the end cloudy and wet. The pr. Winds S. W.

ember.

A good deal of fair weather, some clouds and rain; the 14th, 28th and 29th much rain: Wind high the 23d, 27th, 28th, 30th. The pr. Winds S. W.

1718. 1719.

W I N T E R.

ember.

Great rains and storms at the beginning, and pretty often cloudy and wet thro' the month: frosty from the 13th to the 16th. Some little snow or fleet. The pr. Winds S. W.

Extraordinary pleasant, warm and dry weather; no frost nor snow: very little rain. Winds generally S. W.

uary.

A wet month, particularly the 1st, 2d and 8th, in the nights: high winds the 6th, 7th, 8th, 21st and 22d, it ended fair. The pr. Winds S. W.

S U M M A R Y.

The Spring variable.

Summer warm, fair and pleasant.

Autumn mostly fair.

Winter mild, very little frost.

1719.

S P R I N G.

rch.

Alternately fair and cloudy, and showers of hail and snow. The 3d and

and 14th Wind pretty high. The pr. Winds N. E.

April. A good deal of fair weather but clouds and showers interspersed, and it ended fair. The pr. Winds N. E.

May. Alternately fair and showery the 3 first weeks, thence to the end fair, and at the last week extremely hot. The pr. Winds S. W. and E.

S U M M E R.

June. Fair weather prevailed, but interrupted by clouds and showers. The pr. Winds S. E. and W.

July. Fair, sometimes sultry, sometimes cloudy and wet : thunder frequent. High Wind the 4th, 19th and 31st. The pr. Winds S. E.

August. Fair mostly, tho' some rain, and clouds not unfrequent. The 27th and 31st frost The 1st, Wind high. The pr. Wind W.

A U T U M N. 1719.

Septemb. Alternately fair, cloudy and wet : the 12th and 20th Wind pretty high. Wind S. W. the first half : ended dry, with sharp Winds from the N. E.

October. Alternately fair, cloudy and wet. The 16th, rain all day and night. Wind S. E. the 19th rain all day. Wind S. W. The pr. Wind S. W.

Novemb. Alternately fair, cloudy and wet : the 19th great rains ; Wind S. W.

The

The 27th heavy showers. Wind N. Sometimes a little frost. Wind high the 12th, 17th, 18th, 19th and 25th. The pr. Winds S. W. and W.

1719. 1720:

W I N T E R.

Decemb. Fair, cloudy, wet, and frequently frosty. The 5th Wind high at S. W. the 6th a great rain at night : The pr. Wind S. W.

January. Frosts and a little snow the fore part of the month, else fair, cloudy, wet, and frequently high Winds, particularly the 1st, 2d, 4th, 6th, 7th, 12th, 13th, 14th, 15th, 17th, 18th, 19th, 27th. The pr. Winds S. W.

February. Fair, cloudy, wet, windy, and frequent frosts and snow. High winds the 1st, 6th, 7th, 12th, 18th, 19th, 23d. The 26th and 27th great storms. The pr. Wind S. W.

S U M M A R Y.

The Spring variable.

Summer fair,

Autumn variable.

Winter wet, windy and frosty.

O B S E R V A T I O N S.

1. From 1714 to 1719 was a set of six dry years in *England*, which also agrees to the State of the Weather here

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Qq

as

Registry of the

as far as described above, from the year 1716 inclusive.

2. *July 17*, was a most notable Thunder and Lightning over the City of *Dublin*, where all the South part of the Heavens seemed to be in a flame. It lasted from six in the evening 'till three in the morning, being such as had not been known in *Ireland* in the memory of man. It did incredible mischief, not only in burning hay-ricks and blasting of Corn, but moreover as it was also attended with a violent rain, it raised a great flood, particularly in *Patrick-street*, where the lower rooms of some of the houses were overflown about two feet.

3. On the 19th of *March*, at thirty minutes past seven in the evening, a Meteor or Ball of Fire appeared to the South of *Dublin*; its altitude not above 12 degrees: it continued burning for the space of 6 minutes, and gave so great a light as to efface that of the Moon and Stars, which then shone: it vanished on a sudden, and left a great train of smoak behind it.

1720.

S P R I N G.

March.

Fair, cloudy and wet, and some frost, hail and snow the fore part of the month: great rains the 24th, 28th, 29th. Wind high the 10th and 16th,
a great

Weather.

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- April.* a great storm the 24th. The pr. Winds N. W. and S. W.
- Alternately fair, cloudy and wet : the 30th at night great rains : from the 9th to the 14th hoar frosts in the Mornings. The 19th and 20th a hurricane doing great damage by floods and wrecks. The 27th wind high. The pr. Winds N. E.
- May.* Alternately fair, cloudy and wet : from the 26th to 31st very cold sharp mornings The pr. Winds E. and S. E.

S U M M E R.

- June.* Alternately fair, cloudy and wet most of the month, and cold mornings at the beginning : heavy rains the 7th and 12th. Wind high the 16th. From the 20th to the end fair and pleasant. Winds W. N. E. and E.
- July.* Violent high Winds and generally rain withal thro' most of the month, and the Wind at S. W. The latter end of the month pretty fair and pleasant.
- August.* Was generally attended with rains and westerly Winds.

A U T U M N.

- September.* Cloudy, wet and fair alternately. The 29th and 30th great rains ; often stormy and very cold. The pr. Winds S. W

Q q 2

The

October.

The first ten days fair, cloudy and wet, and stormy winds, the rest of the month mild, some rain, and sometimes a brisk gale from the S. W. The pr. Wind W.

November.

The beginning of the month hoar frosts, the middle and end mild and rainy. The pr. Winds W. N. W. and S. W.

W I N T E R. 1720. 1721.

December.

Cloudy, and frequent rain and fleet, very few fair days. The 7th, 10th, 20th stormy, The 20th at night thunder. The pr. Wind N. W.

January.

Cloudy, and often wet and cold : frequent frosts and fleet, few fair days. The pr. Wind N. W.

February.

Cloudy and wet for the most part, particularly the 14th, 17th, 20th great rain and Wind S. E. The 19th a storm at night at S. E. The pr. Wind S. W.

S U M M A R Y.

Spring variable:

Summer wet.

Autumn variable.

Winter cold, frost, fleet and wet.

1721.

S P R I N G.

March.

Alternately fair, temperate, cold, cloudy, rain, and some hail at the beginning :

beginning: pretty smart Gales the 23d and 24th. The pr. Winds S. W. and N. W.

April. Alternately fair, cloudy and showery: cold the fore part of the month. The pr. Winds S. W. and N. W.

May. Fair weather prevailed, tho' frequently interrupted by clouds and showers. The pr. Winds S. W. and N. W.

S U M M E R.

June. Cloudy and frequent rains, and some fair days. The pr. Winds S. W. and N. W.

July. Fair weather prevailed, tho' sometimes cloudy and wet. Thunder the 16th, 21st, 25th. Winds N. W. S. W. and S. E. nearly equal.

August. Cloudy and frequent showers, not many fair days. The pr. Winds S. W. and N. W.

A U T U M N.

Sept. A fair and pleasant month for the most part, tho' not without clouds and rain. The 4th rain all day. Wind E. The pr. Wind W.

October. Cloudy and showery, not many fair days. The pr. Wind S. W.

Novem. Cloudy and frequent rains: few fair days. The 18th rain and wind all day. The 13th, 18th, 26th stormy. The pr. Wind S. W.

W I N-

W I N T E R. 1721. 1722.

Decemb.

The fore part of the month cloudy and frequent showers, some of hail, with cold weather, and the Winds S. W. and N. W. but from the 24th to the end it was uncommonly fair and cloudless, and the weather temperate and warm, with easy gales at W. the roads dry and dusty.

January.

The fair weather closing the last month, continued to the 10th of this, save that it was colder; thence to the end mostly cloudy and wet; the 23^d only frosty. High winds the 12th, 14th, 15th, 25th, 27th. A storm the 26th. The pr. Winds S. W. and S.

February.

Cloudy and wet, and some few showers of snow and hail: many fair days: a little frost the 22^d, 23^d, 24th, in the Mornings. High winds at S. E. the 25th. The pr. Winds S. W.

S U M M A R Y.

Spring variable.

Summer wet.

Autumn variable, incl. to wet.

Winter mild, open, dry and fair.

1722.

S P R I N G.

March.

Cloudy, wet and fair alternately. The 6th rain most of the day. Wind at E. Snow the 13th, 14th, 15th. High Wind at S. E. the 9th, 10th, 24th.

- April.* 24th. Great Thunder the 30th. The pr. Winds S. E. N. E. and E.
 Rather more fair days than cloudy or showery. The 18th and 19th cold wind and snow in the country. The 14th and 15th high wind at S. W. The pr. Wind N. E.
- May.* Much rain in frequent and plentiful gluts, tho' some fair days were interposed. The pr. Wind S. W. High wind the 21st and 30th.

S U M M E R.

- June.* Fair and warm, but clouds and showers also frequent, particularly the 6th, 17th, 25th, 27th. Wind high the 23d, 24th. The pr. Winds W. S. E. and S. W.
- July.* Cloudy, and much rain from various points, few fair days. Thunder the 7th. Windy the 3d, 7th, 8th, 14th, 15th, 16th, 29th. The pr. Winds W. and S. W.
- August.* Fair and pleasant for the most part, yet plenty of rain the 2d, 3d, 4th, 7th, 18th. Wind high the 4th and 9th. The pr. Wind N. W.

A U T U M N.

- Septemb.* Frequently fair and pleasant; sometimes cloudy and a little rain. Windy the 1st. The pr. Winds S. W. and W.
- October.* Fair and pleasant mostly, sometimes cloudy and wet: plenty of rain the 3d, 21st, 25th. Brisk gales the 26th, 27th,

27th, 28th, frosty mornings the 22d, 23d, 24th. The pr. Winds S. E. and W.

Novemb.

The first half of the month variable, then some days of plentiful rain, thence almost to the end frosty. The 15th stormy at S. W. the 19th and 20th at S. E. The pr. Winds S. W. and N. W.

W I N T E R. 1722. 1723.

December.

Cloudy, wet, a little windy, some fogs, particularly the 26th at night : a little fleet, snow and frost from the 20th to the 24th. Great rain the 19th, 29th, 30th. Windy the 1st, 2d, 3d, 4th, 12th, 13th, 14th, 16th, 18th. The pr. Winds S. W.

January.

Slight and interrupted frosts and some snow the first twelve days, then cloudy, wet and windy, then again towards the end some snow and frost : Great rain the 19th and 31st. High winds the 14th, 19th, 20th, 22d. The pr. Wind W.

February.

Alternately cloudy and fair, and frequent rains, mild weather mostly, except some frosts near the end : much rain the 11th, 27th. High Wind the 17th. Great storms the 19th, 20th, 21st. The pr. Winds S. W.

S U M M A R Y.

Spring variable, inclined to wet.

Summer moderately dry and warm.

Autumn

Autumn mostly fair.

Winter incl. to wet, and somewhat windy, little frost.

1722, 1723.

S P R I N G.

March.

Alternately fair, cloudy, wet and windy. High winds the 1st, 9th, 10th, 11th, 13th, 14th, 16th, 22d, 23d. The 24th, a great storm. The pr. Winds S. E.

April.

A good deal of fair weather and very hot, from the 17th, to the 21st inclusive, but Clouds and Showers interspersed : high Wind the 9th, 26th, 27th, 28th. The pr. Winds S. E. W. and N. W.

May.

Unusually hot and dry, with an almost constant course of E. Winds, the heat excessive and sultry, with great dews, being the hottest May remembered. Little rain except on the 6th, 22d, at night, and the 29th, and 30th. The excessive heat did incredible mischief by burning up the grass and other vegetables.

S U M M E R.

June.

Mostly fair and hot : the 2d, and 4th, great rains : the 4th, and 11th, Thunder : the 6th, and 9th, high wind. The pr. Wind S. E. fair, sometimes cloudy and showery : much rain the 12th, 17th, and 23d, at night, and on the Thunder, of which a good

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deal

August.

deal the 17th, 18th, 20th. The pr. Winds, E. N. E. and W.

The hottest and (A) driest weather in the memory of man: much rain the 13th, and 16th. High wind the 11th. Thunder the 9th. The pr. Winds S. E.

A U T U M N.

September.

Generally fair, warm and pleasant: little rain except on the 24th. Wind pretty high the 11th, and 28th. The pr. Winds S. E. and N. W.

October.

A month of extraordinary fine weather, fair and pleasant: the 29th, very hot: much rain the 8th, in the evening and the 10th. The pr. Wind N. W.

November.

Cloudy, wet and often windy: much rain the 4th, 10th, and 11th, (and 20th, 27th, at night) and the 28th, and 29th. High Winds and Storms from the 9th to the 14th, also the 22d, and 27th. The pr. Winds S. W.

(A) Much thunder and lightening in England and other parts of Europe, doing incredible damage in burning Towns, and killing of people.

W I N -

WINTER. 1723, 1724.

December.

The first half rain, snow, frost and storms, the latter half warm and pleasant, sometimes hot and sultry. The 16th, and 30th, great rains at night: the 4th, 10th, 11th, stormy. The pr. Wind S. W.

January.

Cloudy, wet and windy, sometimes fair: much rain the 3d, 6th, (and 18th at night) and the 19th. The 3d, 4th, 5th, 6th, 9th, 10th, 13th, 14th, 16th, stormy: a little frost at the end. The pr. Wind S. W.,

February.

Variable, wet, frosty, some snow, several fair days, and concluded frosty: much rain the 1st, 3d, 5th, and 20th. Windy the 9th, 10th, 15th, 16th. The pr. Winds S. W. and W.

SUMMARY.

Spring unusually hot and dry.
 Summer excessively hot and dry.
 Autumn unusually hot and dry.
 Winter pretty open.

OBSERVATIONS.

1. This year was an excessive dry one, as it was also at Paris, the rains there amounting to no more than 7 inches, 8 lines, whereas the mean year comes to 19. See Philosoph. Transf. vol. 49. Part 1.

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2. The

Registry of the

2. The latter end of March was pleasant and dry, attended with E. Winds, and proved very sickly, several persons dying suddenly with a violent pain in the head, others continuing sick a considerable time: it seized none but the young, middle-aged and healthy. It was moreover a very fatal year in England, particularly in inflammatory diseases, which is agreeable to other observations of the unwholsomeness of dry Seasons in this Climate.

3. Wasps swarmed in several parts of this Kingdom: and many rivers were dried up.

4. There was a second crop of Cherries and Strawberries, as in Kent, where also in November they had a second crop of Apples, Green Pease, and Currants.

1724.

S P R I N G.

March.

A good deal of fair weather, but variegated with clouds and rain. Rain all the nights of the 10th, 12th, 15th High Winds the 14th. The pr. Wind N. E.

April.

Alternately fair, cloudy and showery, and concluded fair and hot. High Wind 8th, 23d, 24th, 25th, 26th. The pr. Wind S. E.

May.

Fair weather for the most part: much rain the 7th, and 26th. High wind the 5th, 8th, 26th. The pr. Wind E.

S U M-

S U M M E R.

June.

Mostly fair, the 10th at night great rain : the 12th, rain all the day. The 14th, 19th, 23d Windy : and high Winds about the end of the month. The pr. Wind S. W.

July.

Frequently cloudy, and wet the greatest part of the month ; the 3d, and 8th, high Wind. The 8th, and 13th, great thunder and rain. From the 25th to the end mostly very hot and pleasant, tho' some small showers interperfed. The pr. Winds W. and N. W.

August.

Some fair days, but more wet and windy, and sometimes great rains. High Winds the 16th, 17th, 23d, 28th. A Storm the 21st, at S. W. The pr. Wind S. W.

A U T U M N.

Sept.

Fair in a great measure, but clouds and rain interposed, particularly the 11th, rain all day, and the 12th, rain all night : the 5th, blew hard ; the 23d, pretty high. The pr. Winds E. S. W. and W.

October.

A month of extraordinary good weather, mostly fair : the 15th, 25th, 30th, flor-

stormy. The 20th, 21st, 22d, frosty mornings. The pr. Winds S. W. and W.

Novemb.

Changeable, Cloudy, a little rain, fair and sometimes frosty: the 19th much Snow on the mountains: the 25th, in the evening a perfect tempest at W. but of short duration. The pr. Wind W.

W I N T E R. 1724. 1725.

December.

Frequent frosts, rains and stormy winds, particularly the 7th, tempestuous; and from about the 15th, to the 20th. Hurricanes, and several Ships lost: the 25th, in the evening, a perfect tempest for 2 hours, the wind S. E. and the floods overflowed the Quays and loosened the arches of Essex-bridge. High winds the 11th, 12th, 22d, 24th, 27th, 28th. The 17th thunder and lightening. The pr. Winds S. W. and W.

January.

A good deal of fair weather. Snow the 11th, 13th, 14th, 15th.—Windy the 4th and 12th. The 13th tempestuous at night. The pr. Winds S. W. and S. E.

February.

A month of pleasant and mostly fair weather: from the 5th, to the 10th, frosty mornings. From the 13th, to the 16th, great dews equivalent to rain. The pr. Winds S. E. and S. W. and fair with both.

S U M-

S U M M A R Y.

Spring mostly fair and pretty dry.

Summer wet.

Autumn mostly dry.

Winter open, first stormy, then fair and pleasant.

REGISTRY of the WEATHER,
continued from my own Observations.

1725.

S P R I N G.

March.

Mostly fair and pleasant, sometimes sharp and cold, particularly from the 14th, to the 20th. The 11th high Winds at S. E. The pr. Wind N. E.

April.

Alternately fair, cloudy and showers. The 20th, 21st, a good deal of rain; The pr. Wind S. W.

May.

A good deal of fair weather, but with clouds and rain interspersed. The 27th, 28th, stormy: the 12th, and 20th, hot; towards the end, cold. The pr. Winds N. E. and S. W.

S U M M E R.

June.

Frequent and very plentiful rains, not many fair days, tho' it concluded fair and very hot. From the 7th, to the 17th, very cold and unpleasant. The 23d, stormy and cold. The pr. Wind W.

Rain

July.

Rain and cold Winds prevailed until the 23d, and the Wind S. W. The 7th, and 8th, stormy. From the 23d, to the end mostly fair, sometimes warm, with the S. E. and E. Winds.

August.

The beginning of the month mostly fair, but the remainder frequently cloudy, wet and cold. The 9th, 16th, 23d, much rain. The pr. Winds W. and S. W.

A U T U M N.

Septemb.

The first half of the month for the most part fair, and frequently hot, the latter half frequent rains, and much colder: the 19th, 20th, 21st, 23d, rain: the 27th, and 28th, much rain and high Winds. The pr. Winds, W. and N. E.

October.

Fair, cloudy, foggy, pretty frequent rains. High winds the 1st, 12th, 13th, 17th, and 20th, very cold the 8th, and 10th. The pr. Wind S. E.

Novem.

Fair, cloudy and wet by intervals: much rain the 5th, 16th, 29th. High winds the 1st, 3d, 15th, 16th, 25th, and 29th. Frosty the 12th, 13th, 14th. The pr. Wind, N. W.

W I N.

W I N T E R. 1725, 1726.

December. Frosty in the beginning, and some snow, as also the 30th, in the Country: else alternately fair, cloudy and wet. The 9th, and 11th, much rain. A Storm the 2d. High winds the 5th, 9th, 20th, 21st, 22d. The pr. Wind W.

January. The 1st, and 2d, much rain, and a Storm and Sleet, with E. Wind and a great flood: a month of the hardest weather for snows, rains, floods, and the greatest inundations over all Europe, that has been remembered. High winds the 1st, 2d, 15th, 27th. The pr. Winds N. W. and S. W.

February. Cloudy, rarely fair: cold and frequent showers of snow or sleet, besides cold rains. The 3d, and 6th, much rain: the 18th stormy: the 25th, and 26th, frosty. The pr. Wind N. W.

S U M M A R Y.

Spring inclined to fair and dry.

Summer wet and cold.

Autumn various.

Winter cold, snow and rain frequent.

1726.

S P R I N G.

March. A good deal of fair weather, though not without clouds and rain: some

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warm days : the 22d, and 31st, stormy. The pr. Wind S. W.

April.

A good deal of fair weather, but with clouds and showers, interspersed. The 13th, stormy. The pr. Winds S. W. and N. W.

May.

A good deal of fair and warm weather, and pretty frequent thunders : not much rain. The pr. Winds S. W. and W.

S U M M E R.

June.

Alternately fair, cloudy and frequent rains, and sometimes very hot. The pr. Winds S. W.

July.

Fair, but frequent clouds and rain. The two last days stormy. The pr. Winds S. W. and N. W.

August.

A good deal of fair weather, and often hot and sultry, and frequent clouds and rain. The pr. Winds S. W. and W.

A U T U M N.

September.

A prevalence of clouds and rain : some fair days, and concluded fair. Four days stormy. The pr. Winds W.

October.

Fair, cloudy and foggy, little rain. From the 18th, to the 21st, Windy. The pr. Winds W. N. W. and S. W.

November.

Alternately fair, cloudy, hazy, foggy and wet : the 12th, snow. The 13th, and 24th, stormy. The pr. Wind S. W.

W I N.

W I N T E R. 1726, 1727.

December.

Most of the fore-half of the month a hard frost, and sometimes hail and snow: afterwards alternately fair, cloudy and wet: the latter part frequent Storms. The pr. Winds N. W. and S. W.

January.

Alternately fair, cloudy and wet, and sometimes a little frost and snow. Three stormy days. The pr. Winds S. W.

February.

Alternately cloudy, wet and fair: frost scarce above once or twice: three stormy days. The pr. Winds S. E. and S. W.

S U M M A R Y.

Spring fair and dry.

Summer various.

Autumn various.

Winter for the most part open.

S I Z E T A B L E

T A B L E I.

A Synoptic TABLE of the WINDS,
From the DIARIES kept in DUBLIN, by
ISAAC BUTLER, *Astronomer*,
From 1717, to 1726.

	E.	N.E.	N.	S.E.	W.	S.W.	N.W.	S.	
1717	27	31	5	34	72	83	79	11	
1718	10	21	0	78	48	103	37	6	
1719	40	48	3	48	73	119	32	6	
1720	13	23	3	31	112	110	47	3	
1721	19	20	2	29	38	91	62	8	
1722	10	32	8	56	68	91	46	12	
1723	41	26	4	58	43	89	50	7	
*1724	11	19	1	41	63	64	22	5	
1725	25	41	2	38	62	62	52	0	
1726	12	12	2	37	53	124	57	7	
	208	273	30	445	632	936	484	65	Total.
	20 $\frac{1}{10}$	27 $\frac{3}{10}$	3	44 $\frac{5}{10}$	63 $\frac{2}{10}$	93 $\frac{6}{10}$	48 $\frac{4}{10}$	6 $\frac{5}{10}$	Medium.

* One Month wanting.

A Summary of the respective WINDS in each
Season, during the aforefaid Period.

	E.	N.E.	S.E.	N.	W.	S.W.	N.W.	S.
Spring	72	108	123	7	152	188	129	14
Summer	80	46	138	4	208	205	96	13
Autumn	23	73	118	12	157	219	97	16
Winter	33	46	66	7	115	324	162	12
Total	208	273	445	30	632	936	484	55

Western

Weather.		399
Western points.	Eastern points:	
W. 632	S. E. 445	
S. W. 936	N. E. 273	
N. W. 484	E. 208	
<u>2052</u>		<u>926</u>

1727.

S P R I N G.

March.

The fore and greater part of the month generally fair, cold, sharp weather: the last ten days frequent rains. The pr. Winds at some point of the E.

April.

Clouds and frequent rains, and sometimes winds through the month, and several fair days. The pr. Winds at some point of the E.

May.

Cloudy, and a good deal of rain, especially the latter part of the month, and often windy; several fair and warm days. The pr. Winds at some point of the E.

S U M M E R.

June.

Cloudy, rain and fair weather alternately. The pr. Winds at some point of the E.

July.

Frequently cloudy, and wet through the month, though several fair days: the 13th, thunder. The pr. Winds, S. E. and S. W.

August.

Fair weather generally through the month, except some plentiful rains near the.

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the end: the 13th, thunder. The pr. Winds N. W. S. E. and S. W.

A U T U M N.

Sept.

Frequently wet and windy through the month: also many fair days. The pr. Wind S. W.

October.

Rains very frequent through the month, and winds frequent, especially the fore-half of it: mizzling, fogs, clouds, and some fair days the latter part of the month. The pr. Wind NW.

Novemb.

Alternately fair, cloudy, fogs and rain. The pr. Winds S.W. and N.W.

W I N T E R 1727, 1728.

December.

Alternately fair, cloudy, foggy and wet; a little snow and frost: the 11th, and 12th, a Storm. The pr. Wind N. W.

January.

Rain and clouds frequent, sometimes foggy, sometimes windy: several fair days. The pr. Winds S. E. and S.

February.

Fair weather prevailed, but not without clouds, rain and fogs, interposed: the 17th, stormy. The pr. Winds E. N. W. and W.

S U M M A R Y.

Spring various.

Summer variable, incl. to fair and dry.

Autumn wet.

Winter mild and open.

1728..

1728.

S P R I N G.

- March.* Alternately fair, cloudy, wet and windy. The pr. Winds W. & N. W.
- April.* Alternately fair, cloudy and rainy, and sometimes a little windy. Gluts of rain more frequent the latter part of the month. The Winds various. N. W. S. E. W. S. W. and N.
- May.* Fair weather prevailed, but clouds and rain frequently interposed, and some brisk winds by turns. The 6th, thunder. The pr. Wind N. W.

S U M M E R.

- June.* Cloudy, and a good deal of rain through the month, and brisk winds, especially the fore-part of the month : the 11th, thunder : several fair days. The pr. Wind W.
N B. On the 23d, Ice was found in the *River Liffey*.
- July.* Alternately fair, cloudy, wet, and sometimes Windy. The pr. Winds N. W. and W.
- August.* Fair and cloudy weather alternately, and a little rain now and then, and high Winds frequent. The pr. Winds W. N. W. and S. W.

A U T U M N.

- Septemb.* Cloudy, sometimes foggy, and a good deal of rain through the month :
 a little

- October.* a little windy the fore-part of the month. The pr. Wind E.
 Alternately fair, cloudy, wet, and sometimes windy the fore-part of the month, with N. W. and S. W. Winds : the latter part of the month fair and gloomy : with S. E. and E. winds : concluded with a Storm at S. W.
- November.* The fore-part of the month cloudy, hazy, frequent rains, and some Winds : then frequent snow, fleet and frost : it ended windy and moist. The pr. Wind W.

W I N T E R. 1728, 1729.

- December.* Cloudy, wet, sometimes windy : some fair days : frost and snow more severe, and of longer duration both here and in *England* than for many years past. The pr. Winds N. N. W. N. E. and S. E.
- January.* Alternately cloudy, rainy, mizzling, foggy, and some frost : windy about the middle of the month. The pr. Wind W.
- February.* Cloudy; rainy, a little windy sometimes : several smart frosts, and fair days. The pr. Winds E. and W.

S U M M A R Y.

Spring mild, and mostly fair.
 Summer wet.
 Autumn various.
 Winter various, incl. to frost.

In

In the Winter was a scarcity of Bread, and the province of *Ulster* suffered greatly, and intermittent Fevers raged among them.

1729.

S P R I N G.

- March.* Alternately cloudy, hazy, wet, sometimes windy, sometimes snow, and some frost. The pr. Wind W. and E.
- April.* Little rain, but mostly dry and fair, with almost a constant series of Easterly Winds common to us, *England*, and *Holland*.
- May.* Fine weather prevailed, but rains frequently intersperfed. Winds very variable, most N. W. S. E. and W.

S U M M E R.

- June.* Cloudy, and frequent rains through the month, and fair days also pretty frequently interposed. The 10th, thunder. The pr. Winds W. S. E. E. and S. W.
- July.* The first twelve days mostly fair and dry, and a series for the most part of E. Winds, the rest of the month W. and N. W. and there were frequent rains, though several fair days interposed.
- August.* Except the beginning, and near the end, when there were frequent rains, the middle, and greater part of the

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T t

month

month was fair. The pr. Wind E.

A U T U M N.

September. Wet and windy, especially the latter part of the month, but many fair days. The pr. Winds S. E. E. S. and W.

October. Alternately cloudy, hazy, rain, and fair weather; and sometimes windy. The pr. Wind W.

November. Stormy and much rain: very few fair days. Floods, common to us, and *England*. The pr. Winds W. N. W. S. W. and S.

W I N T E R. 1729, 1730.

December. Much rain and winds, and this disposition seems to have prevailed elsewhere; for there were great floods in *England* and in *Italy*: often foggy and hazy. The pr. Winds W. S. W. and S. E.

January. Fair, hazy and foggy: little rain. High winds the 22d, 28th, 29th. The 31st, frost, being the first hard weather, this Winter. The pr. Wind W.

February. A good deal of rain, and frequent High winds, and at the latter end, frost and snow. The pr. Wind W.

S U M-

S U M M A R Y.

Spring cold and dry.

Summer mostly dry.

Autumn incl. to wet and windy.

Winter wet, and somewhat windy.

This year there was a great scarcity of
Corn, both here and in *England*,

1730.

S P R I N G.

March.

A good deal of rain: a few fair
days: the 7th, 11th, 12th Windy.
The pr. Winds W. and N. W.

April.

The first half and greater part of the
month frequently cloudy and wet, the
11th, and 12th, windy: but from
the 18th to the end it was fair, and
the wind for the most part E. whereas
in the fore-part of the month, they
were mostly N. W. and W.

May.

The dry weather with E. and N. E.
winds continued to the 10th day, after
which there were not many days free
from rain. The 29th, and 30th,
windy. The pr. Winds E. W. and S.

T o a

1730.

1730.

S U M M E R.

- June.* Cloudy, rainy, and cold : windy the fore-part of the month : The pr. Winds W. N. N. W. and E.
- July.* Cloudy and wet weather prevailed : few fair days. The 1st, 2d, 29th, windy. The pr. Winds N. W. and W.
- August.* Fair and dry weather prevailed, though hazy ; cloudy and wet by turns. The pr. Winds S. W. E. and W.

A U T U M N.

- Sept.* Fair weather prevailed : the 10th, remarkably cold : cloudy and wet between whiles, the 20th, 21st, 22d, a damp fog. The pr. Wind W.
- October.* Cloudy and rainy weather prevailed, excepting a few fair days, and some hazy and mizzling, and it was windy, near the end. The pr. Winds W. and S. E.
- Novemb.* Alternately foggy, wet, cloudy and fair, sometimes windy, the last week frost. The pr. Wind W.

W I N T E R. 1730, 1731.

- December.* Many fair days, some cloudy, hazy, foggy : Rain frequent, the 9th windy. The pr. Winds W. and N. W.

The

January.

The beginning of the month variable. From the 9th, to the 23d, mostly fair, sometimes hazy and foggy. Near the end more wet, with some snow and sleet. The pr. Wind W.

February.

Cloudy and wet through good part of the month, the 2d a hard frost: the 9th, a great Storm. The pr. Winds S. S. W. and W.

S U M M A R Y.

Spring various.

Summer wet.

Autumn various.

Winter open, mild and comparatively dry.

1731.

S P R I N G.

March.

Uncommonly serene, calm and dry. The pr. Winds W. S. W. and N. W. The month concluded with S. E. and E. Winds.

April.

An unusually dry and cold month, for the most part: a little snow. The 15th, 16th, 25th rainy. The pr. Winds S. E. N. E. and E.

May.

The cold weather continued to the 13th day. The first 19 days changeable: from the 20th, to the end, mostly fair and hot: the 24th, thunder. The pr. Wind W.

S U M.

S U M M E R

June. Dry, and frequently sultry, else cloudy, hazy, and sometimes wet. The pr. Wind W.

July. Generally serene, dry and frequently very hot, yet rain often interspersed. The pr. Wind W.

August. Generally fair, and frequently hot. The 23d, 24th, 25th, 26th, rainy, mostly at S. E. The pr. Wind S. E.

A U T U M N.

Septemb. Fair weather prevailed, several warm days, and frequent rains: Windy at the beginning and end. The pr. Wind W.

October. Cloudy, frequent rains and frequent fair days, sometimes mizzling, hazy and foggy, and sometimes a little windy. The pr. Winds S. W. and S. E.

November. Cloudy and wet weather prevailed, sometimes windy: the 26th, a frost. The pr. Wind W.

W I N T E R. 1731. 1732.

December. Cloudy, moist and rainy weather prevailed, sometimes windy; the latter part of the month, frost and snow. The pr. Wind W.

January. Generally cloudy and wet, but a few fair days. The pr. Wind S. E. unusually warm the two last weeks.

Clou-

February.

Cloudy, wet, windy and unusually warm. The pr. Wind W.

S U M M A R Y.

Spring dry and cold, concluded hot.

Summer hot and dry.

Autumn variable, sometimes windy.

Winter wet and warm.

O B S E R V A T I O N S.

The coldness and dryness of the month of *March* extended to other remote parts of Europe, particularly to the *Baltic*, to *Hamburg*, and to some parts of *France*. I spent part of the month of *May*, and most of *July* and *August*, in the W. of *England*, about 20 miles E. from *Bristol*, and the month of *June* in *London*, at which places I kept a diary, and at the same time *Samuel Fuller*, Mathematician in *Dublin*, kept also for me a diary there, and upon a comparison of both, I found that the state of the weather in these several places generally agreed very well as to any remarkable changes to heat, drought, rain or wind, so that v. g. when any one day proved excessively hot in one place, the same proved also excessively hot in the other; and the same agreement generally obtained on any great glut of rain or notable change of the wind, except that

that in *London*, the Winds did not so generally agree to those in *Dublin*; as in the West of *England*; and moreover, some notable rains brought on with Easterly winds, reached *London* 24 hours, more or less sooner than *Dublin*.

I was further confirmed that the same winds or storms, when eminent and remarkable, do often times affect remoter parts of the world at the same time, by a diary of the weather, kept this and several years at *Newfoundland* by *Robert Jaffray*, Merchant, of *Dublin*; from whence it appeared that great storms, and in general, from the same point of Heaven, did ordinarily affect us in *Dublin* and them at *Cape Bonavista* at the same time, as particularly *November 14th*, *December 7th*, *9th* and *13th* this year.

Indeed the particular situation of places may and does often affect the weather in each place, *v. g.* at *Newfoundland*, tho' nearer the sun than we, yet by reason of the N. Wind coming from the mountains of Ice, the Air is much colder than with us, and their E. Winds coming off the great *Atlantic Ocean*, are as remarkable for moisture as ours, that come from the Continent are for serenity and dryness: but, abstract from such particular situations, it is certain that

that large tracts of the atmosphere are affected in the same manner, at the same time, by more general and extensive causes.

1732.

S P R I N G.

March. Windy at the beginning, then alternately fair, cloudy and wet. The 10th and 11th snow: the 26th hail. The 3 last days plentiful rain. The pr. Wind N. W.

April. Alternately fair, cloudy and showery. The 14th and 29th hail. The pr. Winds N. S. E. N. E. and S. W.

May. Cloudy and rainy weather prevailed, but a few fair days. The pr. Winds S. W. S. E. and E.

S U M M E R.

June. Fair weather for the most part, but a little rain. The pr. Winds W. N. W. E. and S. E.

July. Cloudy and rainy weather prevailed, sometimes a little windy: several sultry days, and some cold. The pr. Winds W. N. W. and S. W.

August. Fair weather prevailed: the 12th and 13th much rain, with E. and S. E. wind. The 25th and 26th windy at S. W. The pr. Winds W. and E.

A U T U M N.

September. The first 9 days generally fair, the rest of the month for the most part windy, cloudy and wet. The pr. Winds S. E. and W.

October. Cloudy, wet and windy weather prevailed. The pr. Wind W.

November. Fair, gloomy, and sometimes foggy; frequently frosty; little rain or wind. The pr. Winds N. and N. W.

W I N T E R. 1732, 1733.

December. The greatest part of the first 13 days fair, the remainder of the month cloudy, wet and windy. A very warm Christmas. A great storm the 20th at night, and 21st at W. Another the 29th and 30th at S. W. and W. The pr. Winds S. E. W. and S. W.

January. Cloudy, wet, windy and unseasonably warm. A few fair days. The 4th a storm at S. and S. W. The 7th another at S. W. The 29th a third at S. W. The pr. Wind S. W.

February. The cloudy, wet and stormy weather continued thro' this month, scarce above one fair day, viz. the 9th. The 11th a storm at S. W. The 3d and 4th another at W. or S. W. The 19th a third storm. The pr. Winds W. S. W. and N. W.

S U M-

S U M M A R Y.

Spring variable.

Summer moderately fair or dry.

Autumn mostly wet and windy.

Winter wet, windy, stormy and warm.

1733.

S P R I N G.

March.

Alternately cloudy and fair at the beginning, but the succeeding and greater part of the month snow, rain and sleet were frequent, and it was excessively cold. The 25th very warm and it concluded fair and warm. The 8th windy at N. W. The 24th windy at S. The pr. Winds N. E. S. E. N. W. and N.

April.

Fair and dry weather prevailed, tho' variegated with clouds and rain. The pr. winds E. N. E. and S. E.

May.

Uncommonly fair and dry thro' the greatest part of the month. The pr. Winds S. E. E. and N. E.

S U M M E R

June.

The fair and dry weather continued the first 6 days : afterwards showers were interspersed, tho' fair weather prevailed thro' the month in general. The 13th and 28th some Thunder. The pr. Wind S. E.

U u 2

The

July.

The fair and dry weather continued thro' the month for the most part, The 5th, 6th and 7th hot and sultry. The 16th and 17th thunder, lightning and rain. The pr. Winds W. and N. W.

August.

Cloudy, and often wet and windy : a cold month and a sudden onset, as it were of winter. The 12th a storm at W. The pr. Winds W. N. W. and S. W.

A U T U M N.

September.

Some fair days, but cloudy wet and windy weather prevailed. The 26th thunder. The pr. Winds N W. and S. E.

October.

Fair weather. prevailed : windy towards the end. The 20th a hoar frost. The pr. Winds S. W. S. E. and N.

Novemb.

Cloudy, wet and windy weather prevailed. The pr. Winds S. W. & W.

W I N T E R. 1733. 1734.

December.

Wet and very windy : the 11th, 12th, 13th and 14th stormy at S. W. The 13th thunder and hail. The 23d high Wind at S. W. like a Whirlwind, or Tornado with lightning. The pr. Winds S. W. and S.

January.

The first 7 days some snow and frost, and partly with a S. W. wind : also the 13th and 14th frost. The 9th and 10th rainy. The rest of the month
for

for the most part fair, and sometimes cloudy, foggy and hazy. The wind-variable W. S. W. S. E. and N. W.

February.

The greater part of the first half of the month fair and dry, the rest mostly cloudy, wet and windy: the 12th warm: the 14th and 15th a storm, and it continued windy the 3 following days. The pr. Winds W. S. W. and S.

S U M M A R Y.

Spring very dry, with a series of N. E. E. and S. E. winds.

Summer dry, but concluded wet and windy.

Autumn wet and windy.

Winter wet, windy and very warm, and so in *England*; and Prim-roses and Violets were in blossom.

1734.

S P R I N G.

March.

Wet and windy weather prevailed. The 23d a storm at S. The pr. Winds S. W. and W.

April.

Warm and serene like *June*, especially to the 16th day, and a forward Spring. The latter part of the month showers more frequent, and sometimes hail. The 19th cold, and at night a storm at N. E. with lightning. The pr. Winds S. E. and S. W.

Unusually

May.

Unusually cold, with changeable weather, and frequently hail, some hoar frosts and snow, so that the 24th was the first summer-like day. The 14th and 15th hail, thunder and lightning. The 26th 27th, 28th a great fall of rain, with N. E. and S. E. winds. The pr. Winds N. N. W. S. E. and E.

S U M M E R.

June.

Cloudy and wet weather prevailed. The pr. Wind S. E.

July.

Cloudy, wet and mizzling for the most part. The pr. Wind W.

August.

Fair weather prevailed, but clouds and showers were frequently interspersed. The latter part of the month windy. The pr. Winds W. and S. E.

A U T U M N

September.

The first 7 days for the most part cloudy, wet and windy: the middle of the month mostly fair; towards the end often windy and wet. The pr. Winds W. and S. W.

October.

The first day a storm at S. W. and thunder and lightning; else serene; cloudy, hazy, foggy, mizzling and rain alternately. The pr. Winds S. W. N. W. and W.

November.

Alternately fair, cloudy, hazy and foggy. The 8th and 27th frost; the 25th

25th and 26th snow: the 28th and 29th stormy at W. and S. W. the 23d and 24th rainy. The pr. Wind S. E.

W I N T E R. 1734, 1735.

ber. Cloudy, rainy and windy weather prevailed, but a few fair days: the Barometre below 28 inches: the 22d frost. The pr. Winds S. W. W. and N. W.

try. Cloudy, rainy and windy weather still prevailed, sometimes foggy and mizzling: the 7th and 8th a storm at S. W. The 9th, 10th, 14th, 15th, 21st and 25th frost. The pr. Winds W. S. W. and N. W.

ary. Cloudy, mizzling and moist for the most part to the 17th. The 6th warm like summer. From the 17th to the end more fair. The 19th snow and hail: the 21st a frost. The 7th, 10th and 23d windy at S. W. and W. The pr. Winds S. W. W. and N. W.

Of Spring the two first months warm, but followed by a cold nipping May, hurting the fruits and burning the grafs.

Summer wet.

Autumn changeable.

Winter wet, windy and mild.

O B-

OBSERVATIONS.

Antecedent to the great rains in *May*, and probably a natural presage of them, as a token of such a Collection of Vapors as afterwards descended in rain, was a remarkable phænomenon on the 25th, at six in the morning, when with very fair weather, the sun very bright, and a brisk gale at N. E. there appeared a Parhelion or Mock-sun in the same parallel of altitude with the sun, but about 15 degrees to the North of it, in a thin, whitish cloud, and exhibited rays exceedingly bright in those parts of it which were averse to the Sun: its diametre something larger than that of a full moon: it continued above an hour.

In *June* the Bere in several places was blasted. The wet summer was followed by a small grain in the Corn, and much stalk; but grass was plentiful, at least in the up-lands.

The storm in *January* did great damage in *England*, and extended to *France*, *Holland* and *Flanders*.

In *February* there was a very great Rot among the Hares: in open Winters there is a young spring of grass, which they and the sheep feeding on, it proves pernicious.

N. B.

N. B. The state of the weather in the North of *England* as described in *Short's Chronological History*, for a considerable series of time, agrees very nearly to ours, viz. From *September 28, 1731*, to *June 12, 1734*, it was mostly droughty, no general or great floods or rains, and the Springs failed in most places. Then *June 12, 1734*, began the long wet season, and continued mostly so to *February 2, 1736*, viz. a year and 8 months, after 2 years and 9 months drought.

1735.

S P R I N G.

March.

Cloudy and wet weather prevailed. The 3d, 19th, 20th, 24th cold, and some frost, snow or hail. The pr. Wind N. E. S. E. and N. W.

April.

Alternately fair, cloudy and wet, as usual. The pr. Winds S. E. W. N. E. and S. W.

May.

Fair weather prevailed, sometimes cloudy and a little wet, sometimes hail. A cold, dry and parching month. The pr. Winds N. W. N. N. E. and W.

S U M M E R.

June.

Cloudy, wet and cold weather prevailed, and sometimes windy. The pr. Winds W. S. W. and N. W.

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X x.

Cloudy,

July.

Cloudy, wet and very cold, and sometimes windy: few summer days: a very backward season in fruits and grain. The pr. Winds N. W. S. E. S. W. and W.

August.

The first 11 days generally fair, and the Winds S. E. and N. E. thence to the end wet and windy, with S. W. and W. Winds.

A U T U M N.

September.

Cloudy and rainy weather prevailed: sometimes windy. The 2 first days very sultry, cold afterwards: the 20th hot again. The pr. Winds S. E. and W.

October.

Cloudy, hazy and frequent rains, tho' with a frequent interposition of fair days. The 1st, 11th, 28th and 30th cold. The pr. Winds S. E. and E.

November.

Wet and windy weather prevailed, but a few fair days: much rain afterwards. The pr. Winds S. E. W. S. W. and N. W.

W I N T E R. 1735, 1736.

December.

Cloudy, wet and mizzling weather prevailed; the 8th thunder and lightning, the 5th, 14th and 15th frost. The pr. Winds S. E. S. W. and W.

January.

Much rain, and often windy. The 14th, 15th, 16th, 23d frost: some little snow and fleet interspersed. The pr.

February.

pr. Winds S.W. and S. E. both attended with wet weather.

A good deal of rain, frequent snow and fleet: the 12th, 18th and 24th frost. The pr. Winds N.W. N. S.E. and E.

S U M M A R Y.

Spring partly open, but ended cold.

Summer cold and wet like winter.

Autumn wet.

Winter very open.

Abundance of moisture thro' the three seasons of Summer, Autumn and Winter.

O B S E R V A T I O N S.

At *Plymouth* the season was much a-like. Hear the melancholic description of it there from Dr. *Huxham*: "*Omnes fructus horæi acerbi sunt & immaturi: vix audis cicadem: rari volitant papiliones: plurimæ aviculæ canentes interplumas exuendas intereunt.*"

At Christmas day some Pear-trees were in blossom.

It may perhaps be worth observing, that, notwithstanding the late excessive moisture of the season, or rather the continued extraordinary moisture of several seasons successively, yet

X x 2

that

that no general Rot appeared among the sheep now, nor for many years past. That disease therefore, when epidemic among them, seems truly to be like a Murrain or pestilence among other Cattle, which invades sometimes this, sometimes that species of Animals, not from mere redundant moisture, but from other causes.

So in 1749 there was no Rot among the Sheep, notwithstanding a like wet winter and cold Spring succeeding; so that it should seem that wet seasons, tho' they may promote, do not for the most part generate this disorder, but that it is owing to more latent causes.

Compare the Observations in 1752 hereafter.

1736.

S P R I N G.

March.

Alternately fair and cloudy the first 10 days and cold, and sometimes snow, thence to the 18th fair and summer-like: thence to the end frequently cloudy and wet. The pr. Winds S.E. S. N. E. and E.

April.

Alternately fair, cloudy and wet. From the 10th to the 15th cold, and hail and frost. The pr. Winds S. E. and N. W.

May.

Fair, but frequent and plentiful rains were interposed. The 19th and 31st very

very hot. The pr. Winds S. E. and N. E.

S U M M E R.

June. Mostly fair and very hot, even the hottest *June* that is remembered since the year 1723. The pr. Winds E. S. E. N. E. W. and N. W.

July. Mostly fair and hot, yet not without showers. The pr. Winds W. S. W. S. E. N. E.

August. Fair weather prevailed, but clouds and rain frequently interposed. The pr. Winds S. E. S. W. and N. W.

A U T U M N

September. Serene, but often cloudy, foggy, mizzling, and sometimes a little rain or wind. The pr. Winds S. W. N. W. and W.

October. Fair weather prevailed, cloudy, foggy and wet at intervals. The 25th and 26th an unusual warmth in the Air, followed by great storms at S. W. the 27th, 28th, 29th, 30th. The pr. Winds S. W. W. and S. E.

November. Fair, and often cloudy, some fogs and rain, and frequently windy. The 26th and 27th a frost. The pr. Winds W. and N. W.

W I N T E R. 1736, 1737.

December. Wet and windy for the most part, but a few fair days: the 14th snow: the

Registry of the

the 15th and 21st frosty. The pr. Winds W. and S.W.

January.

Cloudy, hazy, and often wet and windy, but a few fair days. The pr. Winds W. and N. W. The 17th a spring of Grass.

February.

Cloudy, windy and wet : a few fair days. The 13th a storm at S.W. The 16th and 17th another at S.W. and W. The pr. Winds N. W. W. and S.W.

S U M M A R Y.

Spring generally mild.

Summer very hot.

Autumn moderately fair and mild.

Winter very open, wet and windy.

O B S E R V A T I O N S.

I have elsewhere noted the like heat as that mentioned in *October* this year, to be a forerunner of a storm, so that it is plain that the Air, as well as denser fluids, is capable of effervescences.

I here annex a second Synoptic Table of the state of the several Winds for the last ten years.

T A.

T A B L E II.

Of the WINDS in DUBLIN;
from 1727 to 1736, inclusive.

	E.	N.E.	S.E.	N.	W.	S.W.	N.	S.
1727	59	50	109	35	78	89	138	25
1728	67	31	64	38	126	52	102	27
1729	102	22	68	33	101	51	70	43
1730	44	25	59	35	123	68	73	44
1731	28	23	95	22	150	66	42	33
1732	41	31	61	29	86	77	58	39
1733	31	30	64	20	70	81	58	42
1734	21	23	63	31	77	86	66	24
1735	27	32	85	34	64	70	68	18
1736	26	24	62	28	78	77	67	32
Total.	446	291	730	305	953	717	742	327
Medium.	44 $\frac{6}{10}$	29 $\frac{1}{10}$	73	30 $\frac{1}{10}$	95 $\frac{3}{10}$	71 $\frac{7}{10}$	74 $\frac{2}{10}$	32 $\frac{7}{10}$

NO Comparison is to be made between the absolute number of the Winds in this and the foregoing 1st Table, because the Observations in this were much more numerous and minute than in the foregoing, and consequently the number of Winds must appear far greater here than there, where the Observations were made more feldom.

The

The WINDS of the several Seasons, during
the afotefaid Period.

	E.	N.E.	S. E.	N.	W.	S.W.	N.W.	S.
<i>Spring</i>	172	137	225	98	172	142	202	86
<i>Summer</i>	125	72	216	80	260	184	203	61
<i>Autumn</i>	73	33	156	67	250	200	171	81
<i>Winter</i>	26	49	133	50	271	191	166	99
Total	446	291	730	295	953	717	742	327

Western points.

W. 953
S. W. 717
N. W. 742

2412

Eastern points.

S. E. 730
N. E. 291
E. 446

1467

Here the proportion of the Western points to the Eastern agrees very nearly to that in the first Table above; an argument of the truth of the Records from which the Tables were constructed.

And here we may observe that this Table agrees to the first in most other particulars; as 1st, that the winds from some point of the E. or N. prevail in the three spring months more than in any other season. 2d. That the W. and S. W. winds are the grand predominating winds; but with

with this difference, that in the first Table the S. W. predominates over the W. whereas in the second the W. predominates over the S. W. But we shall see in the subsequent Tables and in the sums total for 43 years, that the S. W. predominates over the W. 3. That the N. W. and S. E. winds are nearly equal, and next in frequency to the S. W. Lastly, both Tables agree in this, that the S. winds are considerably more frequent than the N.

1737.

S P R I N G.

March. Alternately fair, cloudy and wet. The pr. Winds S. E. N. W. and W.

April. Fair, cloudy, squally and rain interchangeably. The pr. Winds E. S. E. N. E. and S. W.

May. The fore part of the month fair, cloudy, and a little rain alternately: the latter part mostly hot and dry. The pr. Winds S. E. and E.

S U M M E R.

June. Fair weather prevailed, tho' sometimes cloudy, and a little rain. Several cold days the fore part of the month, and hot ones the latter part. The pr. Winds N. W. W. S. E. N. E. and E.

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Gene.

July.

Generally fair, except some showers at the latter end: the first 9 days excessively hot: the 21st a storm at S.W. The pr. Winds S. W. N.W. E. S.E. and N. E.

August.

Cloudy; wet, windy and cold weather prevailed: the 6th a slight frost: the Dog-days cold both in *England* and *Ireland*. The pr. Winds N.W. S. W. and N.

A U T U M N.

September.

Fair weather prevailed: some days sultry like Dog-days: some clouds and rain interposed. The pr. Winds S.E. S. W. N. W. and W.

October.

Fair weather prevailed, but clouds and rain frequently interposed. The pr. Winds N.E. N. S. W. S. E. and E.

November.

Fair weather rather prevailed, as in the two preceding months, but with alternities of cloudy, windy, mizzling weather and rain: the 29th a frost. The pr. Winds W. and S.W.

W I N T E R. 1737, 1738.

December.

Mostly cloudy, wet, windy and foggy at intervals, but few fair days. The 18th a storm at S. A little frost with the fogs, but not lasting. The pr. Winds S. W.

Cloudy,

January.

Cloudy, windy and wet : for some time unusually warm, and contrary to custom, warmer than *December* ; the 6th, 7th, 8th and 9th stormy at S.W. The pr. Winds S. W.

February.

Great variety and changes of weather, viz. fair, cloudy, windy and wet, sometimes warm like summer, then frost, snow and hail : the 27th thunder and lightning. The pr. Winds S.W. N.W. S, and S. E.

S U M M A R Y.

Spring mostly fair and warm.

Summer fair mostly, but with little uniformity, some days excessively hot, others very cold, and

August a winter-like month.

, Autumn fair and mild.

Winter open.

O B S E R V A T I O N S.

I spent the greatest part of this Summer in *England*, partly at *London*, and partly in the West of *England*, but continued my Diary of the Weather in *England* ; whilst another was kept in *Dublin*, by Dr. *Richard Weld*, from whence I was confirmed in the general agreement of the weather and any notable changes thereof in both places, as before observed, in the year 1731. And the same observation held upon the comparison of two Diaries kept

Y y 2

this

this year : one in the Co. of *Carlow*, the other in *Dublin*.

Dr. *Moor's* Thermometre, which he kept some years since at *Paris*, was higher here in *July* than he ever observed it in the greatest heats there, even as 86 to 84. Thro' the great heat and drought of the season the Grass was burnt, and there was little Hay : also the Pulse and Spring-Corn were much hurt, and dried up ; but the grain of the winter-corn, bere and wheat, was large and good.

On the 5th of *December*, at six in the evening, began to appear an uncommon redness in the sky, both in the usual region of the *Aurora-borealis*, and at West, which appeared also in other parts of Europe at the same time. — See *Philos. Transactions*, No. 458.

Short, in his *Chronological History of the Weather and Seasons*, gives a minute account of this Meteor, and observes that it differed from the *Aurora-borealis*, and was attended with an uncommon, uneasy heat in the Air, so that many were obliged to strip off their cloaths, and that the streamers issued from under a thick, deep red cloud, under which seemed to be hid a luminous body, so that one might read in a large Church Bible ;
and

and that these streamers were above the region of the winds; and that at *Venice* this Meteor was like fiery, cloven tongues: at *Kilkenny*, like a ball of fire hung in the air: that it bursted with a most terrible noise, and its prodigious flame covered all the Hemisphere a long while, till its fuel was spent: that it was also seen at the farthest part of *Ireland*; and that none of these Meteors are lower than thirty miles.

Compare with this another Meteor in some sort resembling this, *November*, 1758.

The 9th of *January* at night, in the West of *England* was the most remarkable hurricane since *November* 1703, by which great damage was done to houses, woods, shipping, &c.
Short, ibid.

From which description this storm appears to have been much more severe there than with us.

1738.

S P R I N G.

March.

Changeable during the fore and greater part of the month, which concluded with soft spring weather. The Winds also variable.

The

April.

The fore and greater part of the month alternately cloudy, showery and fair. From the 19th to the end much rain and cold weather with hail. The winds S. E. W. and N. W. N. E. and S. W.

May.

Fair and cloudy interchangeably, and a good deal of rain. The pr. Wind S. E.

S U M M E R.

June.

A cold and wet month, but concluded hot. The pr. Wind S. W.

July.

The prevailing weather was fair and frequently hot, yet not without rain interposed. The 28th a storm at N. W. The pr. Winds W. and S. W.

August.

A wet and cold month for the most part, and the pr. Winds W. and N. W.

A U T U M N.

September.

The fore part of the month to the 17th generally wet and windy, and sometimes cold, and the pr. Wind S. W. The 9th a storm at S. W. From the 18th to the end generally fair, and the winds at some point of the E.

October.

A cloudy, moist and rainy month, and the winds variable.

The

November.

The larger half of the month, even to the 19th generally hazy and cloudy, with little rain, and the winds S. E. and the Barometre high. From the 19th to the end wet, with S.W. winds. The 20th and 24th stormy at S. W.

W I N T E R. 1738, 1739.

December.

The first 7 days windy and wet. The 6th and 7th stormy at S. W. and N. W. with lightning: thence to near the end vicissitudes of moist fogs and frost, and sometimes windy and rain. the pr. Winds W. and S. W. even in the frost. The 26th at night stormy at W.

January.

Very windy generally throughout the month, and rain at intervals. The 13th at night and 14th in the morning a violent storm at S.W. preceded by a sultry day. The chief good good weather was 5 days after this storm. The pr. Winds W. and S. W.

February.

The 4 first days mostly fair; thence to the 14th generally windy or wet. The 11th and 12th a storm preceded by sultry weather. From the 15th to the end mostly fair. The pr. Winds W. and S. W.

S U M-

S U M M A R Y.

Spring seasonable.

Summer cold, and wet, except *July*.

Autumn wet for the most part.

Winter stormy and wet.

O B S E R V A T I O N.

The storm in *January* was common to us and *Edinburgh*, reaching the last place the next day, and did much mischief there.

1739.

S P R I N G.

March.

Unusually cold and frosty, and the Thermometre lower than any month this year and much more remarkable for frost, hail and snow than wind, particularly from the 10th to the 21st, when the winds were N. and N. E. and mostly N. E. to the 27th. Mostly serene the first 7 days, and the winds S. W. and N. W. It concluded hazy and cloudy, with W. and S. W. winds.

April.

Fair weather and showers alternately as usual, but the general temperature of the month was unusually cold, and snow and hail were frequent, to the great prejudice of the vegetables.

vegetables. The Winds during the fore part of the month generally N. and N. W. the latter N. E. and S. E.

May. The preceding half of the month alternately fair, cloudy and rainy, and the pr. Wind S. E. The other half of the month serene, and the pr. Winds E. and N. E. The 22d thunder and showers.

S U M M E R.

June. Excepting a very few hot and fair days, the month was generally moist and cold, and the pr. Winds W. and S. W.

July. Unusually cold and moist, the Thermometre not higher than in *May*, but the Hygrometre heavier than in the two last months. Few days without rain, except from the 15th to the 22d. The pr. Winds S. W. N. N. E. N. W.

August. The first 9 days variable; from the 9th to the 20th serene: thence to the end rainy: it concluded cold, wet and windy. The Winds variable.

A U T U M N

September. Generally very wet, tho' sometimes fair. The 10th at night a great storm of wind and rain at N. Winds variable.

October.

Generally dry and foggy to the 25th, and sometimes cold, and the winds S. E. and N. W. with high barometre: thence to the end wet and stormy, and Winds S. W. and N. W.

November.

Alternately rain, frosts, storms and fogs, and the winds variable.

W I N T E R. 1739, 1740.

December.

For the most part fair, but with moist fogs and frost interposed. From the 5th to the 9th wet and windy at S. W. which was the prevailing wind the fore part of the month. From the 27th to the end a most intense frost, and attended with a high wind, intolerably piercing at S. E. and E.

January.

The Frost concluding last month continued throughout this: the greatest intensity of cold was the 27th at night: it was mostly calm, what little wind we had was from the S. E. N. E. and N. W. The month concluded with a S. E. wind, with a gradual, but not durable thaw.

February.

The Frost continued, tho' with a little interruption to the 14th, with winds S. E. and N. E. then succeeded a complete thaw, and alternities of clouds, rain, and fair weather, and the Winds N. W. W. and S. W.

S U M-

S U M M A R Y.

Spring mostly cold.

Summer very wet.

Autumn variable.

Winter frosty, after a long series
of open Winters.

O B S E R V A T I O N S.

By comparing a Diary kept at *Kilnock*, in the Co. *Carlow*, and another in *Dublin*, in the years 1738 and 1739, it appeared that the Weather there and here at the same time was very nearly alike, as to any notable great changes, *v. g.* great rains and storms generally happened at the same time in both places. Hence it is obvious to conclude that the Vapors causing them must arise from some common origin, and particularly the great Atlantic Ocean, not from any neighbouring lake. — See a like Observation on a Diary kept in *Cork* hereafter, in the year 1741.

The Frost of 1739—40, was so remarkable, both for its intenseness and effects, as well to deserve a more minute account; and tho' it is impossible for mankind to ward against all the bad effects of such a Calamity

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when it may return again ; yet some of the effects of this frost were such as possibly may furnish hints for useful precautions on a like emergency.

It made great havock among both Vegetables and Animals, particularly it rotted and destroyed the Potatoes, the support of the poor thro' the Kingdom, but the Parsnips survived, and in some places the Turnips.

It destroyed many of the ever-greens, particularly the Furzes, and killed many Oaks. Many of the birds perished, particularly the Snipes, Field-fares, Quails, and most of the small birds, except Sparrows, and Robin-red-breasts. The Grouse escaped better than most land-fowl, living on heath. The Sea-fowl escaped better ; and it is perhaps worth remarking that the human Inhabitants of the Sea-coasts in some places fared better than those of the Inland Country, being supported by their shell-fish, and some of their Sea-weeds, as Limpets, *Lactuca-marina*, or Slauk, &c.

Many of the Fishes died, nor did the Quadrupeds escape ; for notwithstanding the gradual thaw, there was a Rot among the Sheep, many of them dying of the Red-water ; and
abundance

abundance of the Deer, so that in the King's-park out of 2000, 800 were computed to have perished: the Rabbits also perished in great numbers, nor had we them in their usual plenty for nine or ten years after: and as to its effect on mankind, besides the havock above-mentioned, in which we suffered, in *England* there were several instances of Men killed by the severity of the cold, but I did not hear one instance of that here, tho' of some that lost their limbs. Lesser evils were, that it froze up and made useless our Water-mills, rendered vapid and destroyed our distilled waters and *Pymont-water*; and it froze even *French Brandy*, coagulating it to a Snow.

Having so far described the pernicious effects of this Frost, it seems to be worth while to make some retrospection to the Frosts we have accounts of to any degree of minuteness for about 60 years before, in order to make some comparison between them with respect to their extent, duration, the degree of cold and the Winds attending, and their effects; from whence it will appear that this Frost, tho' of shorter continuance than the several notable Frosts within the period mentioned,

was

Registry of the

was more severe than any of them, viz. than that in 1683, 84, that in 1708, 1709, and that of 1715—16.

That of 1708 extended to *England, France, Germany, Italy*, and almost all Europe.

That of 1716 was common to *England, Ireland* and all Europe.

That of 1739—40, was common to *England, Scotland, Ireland, France, Germany* and all Europe, except *Spain*, which, according to Dr. *Short*, suffered very much by Floods this year.

It also extended to *America*, particularly to *Pennsylvania*, even in the same singular and extraordinary manner as here; for in the Journal of a Mariner of undoubted veracity, I find recorded that in that Province in 1740, was one of the longest and hardest Winters known in those parts by the oldest livers there, divers people in several places being frozen to death, and many Sheep and Cattle perished, and much of the Winter-Corn was killed by the frost.

Next, as to duration, that of 1683 appears to have been the longest, lasting thro' *December* inclusive, and for the most part to *March 26*.

That

That of 1708 about 9 weeks.

That of 1715 the greater part of ten weeks.

That of 1739—40, seven weeks : but this last, tho' the shortest, appears to have been more severe than any of the other ; for we are expressly assured by experiments on the Thermometre (A), that the cold in 1708, was more intense than that in 1683, and by Dr. Short that in 1715 the Thermometre was lower than in 1708, and that the Ice was 9 inches thick, whereas the Ice in 1740, was 18 Inches thick, and consequently the Cold still much greater than in 1683 (B).

The Frost of 1683 was attended by an E. and N. E. wind, that of 1708, by a N. E. that of 1715, by a N. E. and E. that of 1739 was introduced by a S. E. wind and followed by a long Course of N. and E. winds.

Lastly, the effects of these several grand Frosts, as far as I can learn from the records preserved of them, were very much alike ; v. g. that of
1708

(A) Jones's Abr. of Phil. Transf.

(B) I am assured that in *Holland*, where their cold is much more intense, the Ice is frequently three feet thick.

1708 was pernicious to Vegetables and to Mankind, many being frozen to death, being more fatal than any Pestilence upon record. Robin-red-breasts and Larks perished abundantly; and many of the fresh-water fish in ponds that were shallow and long frozen over, were destroyed: and so in 1716 gold-finches and many small birds were killed by the frost; and to conclude, there appears also to have been a great similarity in the diseases attending these several frosts, even by the accounts given us of that of 1708 and 1716, compared to the following of 1739—40, *viz.*

That of 1708 spread an universal mortality, first among tender infants, decrepid old men and valetudinarians, and the diseases prevailing were Coughs, Destillations, Pleurifies, Peripneumonies, Hæmoptoes, Asthmas, and such like disorders, besides an uncommon frequency of Apoplexies, suddenly mortal; Vertigo's and Gouts (c). And so the diseases prevailing in the great frost of 1715—16 were much like those above-mentioned, *viz.* many colds, pleurifies, obstinate opthalmies, &c. and those I have mentioned in

1739

(c) *Rammazini* and others, in the *Historia Epidemica Germaniæ*.

1739—40, were very much alike: to which add (D), that in the Summers of 1666 and 1684, both intensely hot and dry, and preceded by very cold, severe winters and drouthy Springs; Dysenteries prevailed over most parts of Europe, even as with us in 1740, 1741, which were Summers alike circumstanced as above. From all which we may with great probability conclude, that whenever like causes occur, like effects will follow.

It has been remarked that the following years were memorable for great frosts in *England*, viz. 1638, 1661, 1684, 1708, 1716, 1739.

1740.

S P R I N G.

March.

Was a little mild at the beginning, but it was generally very dry and dusty, and the pr. Winds were some point of the N.

April.

Unusually cold and dry, little falling weather but hail or snow: the pr. Winds E. and N. E. The spring 6 weeks more backward than usual.

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3 A

Frost

(D) *Short's Chronological History of the Weather and Seasons.*

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May.

Registry of the

Frost and snow at the beginning :
the disposition to drought continued,
tho' there were some rainy days.
The pr. Winds N. E.

S U M M E R.

June.

Dry, and from the 17th to the 24th.
hot, and the pr. Winds at some point
of the N. or E.

July.

Variable, yet still there was a pre-
valence of Northerly winds, and there
was some frost and ice this month.

August.

Generally moist : the 6th a storm
at S. W. The pr. winds S. E. W.
S. W. and Southerly.

A U T U M N.

September.

Thro' the greater half of the month
were frequent rains, and sometimes
winds, generally at S.W. thence to
the end serene, and it concluded frosty,
and the Winds at some point of the
E. or N.

October.

Frequent frosts throughout the
month, and the pr. winds from some
point of the N. or E. The 31st
a storm.

November.

Frosts frequent, and much more
than of late years, and the pr. Winds
N. and N.W. Some Winds, particu-
larly a storm the 21st at night, at
S.W. with thunder and lightning.

W I N-

W I N T E R. 1740, 1741.

December. Variable at the beginning and end. From the 8th to the 21st frosty. The 21st the thaw was followed by a violent storm at S. E. Still the pr. Winds were at some point of the N. or E.

January. Hazy, wet and windy. Frost from the 6th to the 16th. Winds E. and S. E.

February. Variable the foregoing half of the month, with interpositions of rain and wind, which was generally at S. W. The 16th a storm at S. W. From the 16th to the 24th frosty, and the Winds at N. E. and E.

S U M M A R Y.

Spring cold and dry.

Summer dry, with a predominance of Northerly winds.

Autumn unusually frosty, with a continued prevalence of N. and Easterly winds.

Winter frosty, with a continued prevalence of the same Winds.

O B S E R V A T I O N S.

The storm of *November* 21, and likewise that of *December* 21 and *February* 16, were felt at *Plymouth*; but the storm *November* 1, or rather hur-

3 A 2 ricane,

ricane, mentioned in *Short's Chronological History*, being the most terrible that has happened these many years, the wind N. and N. E. which did inestimable damage on the N. and N. E. coasts of *England*, in shipping, goods and the lives of people does not appear to have reached us.

There was a great dearth of Provisions this Autumn, which proceeded to a Famine in Winter, the Potatoes having failed, whilst all other Provisions bore double or treble their usual price.

1741.

S P R I N G.

March.

Serene, dry, frosty and dusty, and the Winds E. S. E. and N. E. blasting and burning the grass, so that we had less Spring by far than the last month.

April.

Unusually dry, showers exceedingly rare: dusty like a Summer month: still the N. and E. Winds prevailed.

May.

The great drought continued thro' the greatest part of this month, as in the two preceding months, and the general course of the Winds E. S. E. N. E. and Northerly. From the 11th to the 16th very cold.

S U M-

S U M M E R.

June.

The long and severe drought was now tempered by frequent showers. The 19th thunder showers: the 20th and 21st stormy at S.W. The 14th hot, and from the 24th to the end of the month serene and hot: the winds variable.

July.

The preceding half of the month generally serene, and the Winds mostly N. E. The latter half of the month frequent showers, and the Winds mostly S.W. Several very hot days, particularly the 9th, 10th, 25th, 26th.

August.

Generally hot and dry, and more hot days than in the last month. Wind N.W.

A U T U M N.

September.

Great varieties of weather with respect to heat, cold, dryness and moisture. The 7th at night a great storm at E. The Winds also variable.

October.

The weather and winds variable as in the last month. The 18th, 19th 20th stormy at S.W.

November

Variable weather and winds: some Frosts.

W I N T E R. 1741, 1742.

December

Generally foggy and frosty, with some rain interspersed. The pr. Winds E. S. E. and N. E. The

January.

The first 12 days variable weather and winds. From the 13th to the end of the month stormy at S. W.

February.

The stormy Weather continued the first 7 days, and was succeeded by variable weather to the 15th, and the winds hitherto W. and S.W. From thence to the end frost and snow, and the Winds S. W. N. S. E. and Easterly.

S U M M A R Y.

Spring excessively dry, with a continuance of E. and Northerly Winds.

Summer hot, much more than of late.

Autumn variable.

A second frosty Winter, tho' with interpositions of variable and stormy weather.

O B S E R V A T I O N S.

The storm of *Septem. 7th* was common to us and *England*, and particularly *Plymouth*; and accounts were given of great damage done by it even on the eastern coast, particularly in *Lincolnshire*.

There was an excellent crop of most sorts of grain this year.

Upon

Upon comparing a Diary of the Weather kept in *Cork* thro' the years 1739, 1740, 1741, it appears that all great changes of the weather here and there do depend on some one common cause : for the general condition of the several months, as to the temperature of the weather, was the same here as there ; and the setting in of the great frost in 1739, in *Cork*, and its duration agreed exactly to my account of it in *Dublin*, and so, whenever there was a great glut of Rain after a long Drought, the same thing happened with us at the same time or nearly.

And on a Comparifon of the state of the weather and winds as observed by Dr. *Huxham*, at *Plymouth*, with my Registry of the weather and winds in *Dublin* during a series of 20 years, the weather and winds, with a very few exceptions, were the same in both places.

1742.

S P R I N G.

March.

Extremely dusty, scarce any rain or high winds, generally serene and cold, and the Winds N. E. N. W. S. E. and E.

April.

The Drought mentioned last month continued thro' this, which was destitute

May.

titute of its usual showers, except of hail at the beginning. The Winds N.W. N. N.E. W. E. and S. E.

The Drought above-mentioned continued to the 6th of this month : thence to the 13th serene and cold, and the Winds N. N. E. and N.W. Thence to the end rain and fair weather interchangeably, and the Winds W. S.W. S. E. and E.

S U M M E R.

June.

The first half of the month mostly serene and the Winds variable, yet generally at some point of the E. The latter half frequent showers, often fultry, and sometimes a little thunder. The Winds S. E. S. and S.W.

July.

Frequent showers interspersed thro' the greatest part of the month, and it was cool, and the winds variable, but it concluded hot and with an Easterly wind.

August.

Serene and warm, summer longer continued than usual. Winds E. and S. E.

A U T U M N.

September.

Variable as to serenity, wind, heat and cold, and the Winds variable.

October.

Generally very windy and wet : the 2d, 10th and 11th stormy at S.W. The Winds generally between S. and W. There were also frequent slight Frosts.

The

November. The beginning stormy, and the Winds W. thence to the end hail, snow, frost and fogs alternately. The pr. Winds W. N. E. E. and S. E.

W I N T E R. 1742, 1743.

December. The first half of the month generally frosty, and the winds S. E. The remaining part of the month for the most part storms, and the Winds S. W.

January. The stormy weather continued with rain the first 7 days, with W. and S. W. winds. Thence to the 22d fog, frost, clouds and rain alternately, and the Winds E. S. E. W. and S. W. Thence to the end very stormy and wind at S. W.

February. Wet and windy the first 14 days, and the winds generally between S. and W. thence to the 20th serene, the Winds as before: thence to the end wet and windy at W. S. W. and N. W. The 3d a great storm at S. and S. E.

S U M M A R Y.

Spring excessively dry, as the two last years, with a continued prevalence of N. and E. winds.

A second hot Summer.

Autumn variable.

Winter stormy, with some frosts.

O B S E R V A T I O N S.

The end of *April* was excessively hot and dry, so that the Flies appeared.

Provisions this Winter were as plentiful as they were scarce the two last years: Bread at 19^{lb}. 30z. for a shilling, and in the next month at 21^{lb}. 6 oz.

1743.

S P R I N G.

March.

Very cold, and frequent frosts, snow and hail. The Winds variable.

April.

The frosty weather continued the first 7 days, with hail and snow and N. and N.W. winds. The rest of the month seasonable interpositions of showers as usual, and the Winds S.W. S.E. E. and N.E.

May.

Warm, and unusually dry weather the first 13 days, and the Winds Easterly, succeeded by a sudden coldness of some days, with Northerly Winds: thence to the end wet and windy at times, and the Winds W. and S.W.

S U M M E R.

June.

Generally serene and dry, tho' from the 12th to the 18th remarkably cold; but it concluded warm. The Winds variable.

Frequent

July. Frequent showers throughout the month, and sometimes sultry. The Winds variable.

August. Generally serene and hot, and the pr. Winds at some point of the E. The Thermometre higher than for some years past.

A U T U M N

September. Very variable, the beginning generally cold, and the Winds W. and N.W. the middle of the month was warm and Summer-like, and the Wind S. E. The end cold and the Wind N. E. S. E. and N.W.

October. Generally serene and dry the foregoing half of the month, and the Winds variable; the latter half frequent rains and some little frost, and sometimes sultry, and concluded stormy, and the Winds S. E. S. S. W. and W.

November. The wet and windy weather continued the first 6 days, the winds at W. and S.W. This was succeeded by frost and N. and N.W. winds, and this by dark and mizzling weather, and variable winds. The month concluded warm and Summer-like, with S. W. and S. winds.

W I N T E R. 1743, 1744.

December. Generally frosty and foggy, and the Winds variable.

3 B 3 The

January.

The prevailing Weather of the month was frosty: the winds variable.

February.

The first half of the month for the most part fair, and the winds variable. The latter half wet and windy, wind S. W. and S.W. The 18th at night a great storm at W. and again the 28th at S.W.

S U M M A R Y.

Spring variable, but still inclined to cold.

Summer mostly serene, hot and dry.

Autumn very variable.

Winter frosty, concluded stormy.

O B S E R V A T I O N.

In *September* there was the greatest plenty of After-grass that has been remembered; the two former seasons having failed, a glut of Hay now succeeded, and plentiful crops of Corn of all sorts, and the season extraordinarily healthful.

1744:

S P R I N G:

March.

Windy for the most part, with frequent rains, snow and hail, and the pr. Winds at some point of the N. or E.

N. B, From the middle of *February* to the 11th of *March* there has

has been more rain than for many months before, or indeed since the great frost 1739, during the same space of time.

April.

A cold month for the most part, and the pr. Winds Northerly and N.W. The 7th at night a hurricane from one to four in the morning.

May.

Generally fair, and the month concluded hot. The pr. Winds at some point of the E.

S U M M E R.

June.

The fore and greater part of the month fair : at the latter part frequent showers, and sometimes great changes from sultry to cold. The pr. Winds E. N. E. and S. E.

July.

Frequent showers the fore and latter part of the month, and the Winds variable. From the 12th to the 22d serene, and the Winds E. and S. E. It ended cold and wet.

August.

Unusually wet and windy most of the month, and the Winds generally W. and S. W. It concluded stormy.

A U T U M N.

September.

Generally wet and windy as the last month, and the Winds for the most part S.W. and W. and tho' sometimes S. E. these were as productive of rain as the S.W. The 26th at night a storm at S. E.

Very

October.

Very wet and windy like the two preceding months, and the Winds variable, and those from the Easterly points not less attended with rain than the Westerly.

November.

Changeable from fair to rain or wind and sometimes frost, and the winds variable. The 2d, 3d, 6th and 7th stormy at W. and S. W. The 23d and 24th great Floods: it concluded frosty.

W I N T E R. 1744, 1745.

December.

Was memorable for a great height of the barometre, and at the same time very little frost, but a warmth unusual to the Season, and withal a great weight of the hygrometre and redundant moisture, tho' very little rain: pleasant withal and remarkably healthful. The Winds varied from N.W. to W. and S.W.

January.

Serene partly, but with fogs and frost interposed, and two great falls of snow the 9th and 24th, with S.E. and E. winds, and from the melted snow with the rain following, great floods. The pr. Winds S. E. and N.W.

February.

Generally frosty and snow between whiles. The pr. Winds N.W. N. E. or S. E.

S U M-

S U M M A R Y.

Spring very backward.

Summer variable, *August* wet and windy.

Autumn rainy.

Winter foggy and frosty.

O B S E R V A T I O N S.

August the 15th, on the Road between *Gallstown* and *Clonard-bridge*, the day serene and warm, were observed two Mock-suns on the edge of a Circle of near 30 degrees diameter, which was about the real sun; that to the Eastward was clear and shone very bright; the other to the Westward was not so clear.

They appeared from nine in the morning until one in the afternoon, when small clouds driving briskly, obscured both the real and Mock-suns. At six in the evening was a strong gale of Easterly wind, and it began to rain, which continued all the next day and part of the night with violence. Compare the account of the Mock-sun in 1734, which as well as this seems to have been owing to an abundance of Vapours.

The 29th of *August* was a storm common to us and *Chester*, from whence there was a great windfall of Apples, and the crops of Oats, Barley and Pease

Pease were greatly damaged, the grain tho' plentiful, being spilt by the winds. The storm was a little earlier at *Plymouth*, viz. the 28th.

It is to be observed that, whereas since the great frost 1739, until the latter end of the present summer 1744, we had generally a great and unusual prevalence of dry weather ; in Autumn our usual wet weather returned.

The storm the 26th of *September* was a little earlier at *Plymouth*.

The floods that happened on the 25th of *January*, deserve particular notice. There was not a brook or rivulet about *Dublin* but was swelled to a most extraordinary height. The *Liffey* was by a particular observation found to be higher than in *January*, 1726.

This inundation did great damage, drowned some Men and several Cattle, dislodged entirely the poor from their Cellars in the lower parts of the City, and did great injury to the Merchant's goods lodged on the Quays. It broke and tore away the parapet wall of the north arch of *Island-bridge*, carried away an arch with the parapet walls of *Bluebell-bridge*, *Golden-bridge*, and *Bow-bridge*.

It seems not to be unworthy of Observation, that in 1687, *December* 6, there was in *Dublin* a greater flood than this, the rains having been extraordinary for two months before,
but

but on *December 4*, in the evening, a sudden storm of wind and rain arose, the wind at S. S. E. which was followed by a greater flood than had been remembered by the oldest man then living, so that it laid all the lower parts of the City under water up to the first floor, particularly in *Patrick's-street*, where it is said to have ran almost as high as the top of *Patrick's-gate*.

Now there seems to be something of an Analogy between this and our present Flood in several respects; for they were both not only brought on by a S. E. wind after great rains for some months preceding, but those rains at both times were the consequence of a preceding long continued drought, which in both cases was the effect of or consequent upon a preceding extraordinary Frost: for the frost in 1683, 1684, was as great or rather greater than our late one of 1739, 1740, and I am assured that a very great and uncommon drought succeeded also that frost, even as it remarkably did ours of 1739, 1740, even until *August* 1744, since which time there have been great rains, as it were in supply of the late great defect of rain, all the Springs having been long before unusually low, and even now at *January*, not yet arrived to what was their usual height before the great frost.

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3 C

Possibly

Possibly these Observations may furnish both Citizens and Countrymen with some hints for Prognostication and precaution upon the like emergencies.

1745.

S P R I N G.

March. Frost the 3 first days, else the greatest part of the month was warm and summer-like, pleasant and dusty, tho' with a little rain and wind sometimes interposed. It concluded a little windy and cool. The pr. winds S.W.

April. A cool month, frequent hail, frost and snow. The pr. Winds N.E. S.E. S.W. and N.W.

May. Generally very wet and cool, excepting only a very few warm days. The pr. Winds S.W. rarely S.E. but both attended with moisture.

S U M M E R.

June. Generally cloudy and cold, with frequent showers, and but a few hot days. The pr. Wind S.W.

July. Generally serene and warm: the 17th a plentiful rain, and a little at the end of the month, and cold. The pr. Winds N.W. and S.E.

August. Generally very wet to the 23d, but a few fair days. The 16th and 17th stormy at S.W. It concluded fair. The pr. Winds S.E. W. and S.W.

A U-

A U T U M N.

September.

For the most part extraordinarily fair and summer-like, so that it in a great measure compensated for the late excess of rain, and gave a fine opportunity for gathering in the Corn. The pr. Wind S.E.

October.

Began with a hurricane, and the weather was for the most part wet and windy. The 10th and 11th stormy at S.W. and S. The pr. Wind S. W.

November

Gloomy and foggy, less rain and wind than usual this month. Some frosts, especially from the 14th to the 18th. The pr. Wind E.

W I N T E R. 1745, 1746.

December

The first 10 days cloudy and foggy, not unpleasant, with a gentle breeze from the E. Thence to the 24th generally wet and windy, the Wind S.W. Then a Frost of a few days, and it concluded cloudy and mizzling, with a S.E. wind.

January.

Very fair and summer-like thro' most of the first 15 days, and the Winds S.W. S.E. and S. The rest of the month mostly wet and windy: the Winds W. S.W. and S. it concluded frosty.

February.

Generally frosty, and a little snow and hail, and sometimes a little rain. The Winds N.E. N.W. and S.W.

S U M M A R Y.

Spring forward in *March*, but backward by the cold of the two following months.

Summer wet, yet helped out by a summer-like *September*.

Autumn variable.

Winter open, except a frosty *Feb.*

O B S E R V A T I O N S.

In *March* was a Famine among the black cattle in the Co. *Sligo* and *Roscommon* : also Oats and Potatoes were very dear.

In *April* there was a mortality among the black Cattle, which was common to us and other parts of Europe, promoted greatly here, if not occasioned by want of Food, and by bad Hay : the Horses also died in great numbers ; and had it not been for a seasonable supply of Corn from *England* by the vigilance of our Merchants, the famine would have also destroyed mankind in the N. W. parts of the kingdom, where their Potatoes, and the Oats which had been spilt by the storms in the Autumn of last year, failed them, as also their Turf, by reason of the late extremely soft weather.

ther. In the Co. *Armagh*, *Tyrone* and *Derry* their distress was much greater than in the great frost 1739.

1746.

S P R I N G.

March.

Variable according to custom: it began with frost, succeeded by hazy and cloudy weather: from the 8th to the 11th very cold, with snow and fleet: this was succeeded by soft weather and rain, and it concluded fair and cold. The pr. Winds S.E. N.E. and N. W.

April.

The first 18 days alternately fair and cloudy, but mostly cold. The 19th two Mock-suns appeared, which were followed by a storm at S.E. common to us and *Plymouth*; the remaining part of the month warmer and changeable. The pr. Winds S. E. and N. E.

May.

For the most part unusually warm and dry, the Thermometre higher than in *June* or *July*; the Winds S.E. N.E. and E. it concluded with rain and a S.E. wind.

S U M M E R.

June.

Generally cloudy, wet and cool, and contrary to custom wet and cooler than *May*. The Winds variable: the prevailing one S.W.

Very

July.

Very wet and rainy for the most part, the streets dirty as in winter. The pr. Wind S. W.

August.

Fair weather throughout the month (the 13th and 21st only rainy) making compensation for the redundant moisture of the two foregoing months, and attended with plenty of all sorts of grain and fruits, particularly Apples. The Winds N.W. S.W. & W.

A U T U M N.

September.

Great varieties of weather, viz. cloudy, wet, windy, fair, hot and cold alternately. The Winds S.W. N.W. and W.

October.

Fine weather for the most part, some frost, little rain: the roads dry and springs very low. The Winds N. W. W. N.E. and S. E. From the 6th to the 16th moist and mizzling, with high barometre, which instrument, on the contrary was low on some frosty weather that succeeded.

November.

Extremely variable thro' all the changes of cloudy, fair, cold and fleet, another day, v.g. the 1st sultry like summer, and storms, particularly a great storm the 22d at S. W. and W. Else the Winds extremely variable.

W I N.

WINTER. 1746, 1747:

December. The first 20 days squalls of wind and rain, the Wind S.W. and sometimes W. Thence to the 28th cloudy, foggy and mizzling, and the pr. Wind S. E. It concluded with frost and snow, and S. E. and N. E. winds.

January. Some very little frost at the beginning, else for the most part wet, rainy and often squally, and great floods. The pr. Wind S. E.

February. The squalls of rain and wind continued mostly thro' the first 9 days; the pr. Wind S. W. Thence to the end mostly fair or gloomy and pleasant, and the Winds S. E. W. and S. W. From the 15th to the 20th frost and a little snow. Winds N. E. and N.

SUMMARY.

Spring, the first part cold, the last hot and dry.

A wet Summer, except *August*.

Autumn very changeable.

Winter wet, windy, very open.

OBSERVATIONS.

Primroses, Violets, Crow-foot and Colt's-foot, were all in flower the 2d of *February*.

I here annex a 3d Synoptic Table of the State of the Winds during the last ten years.

T A-

T A B L E III.

N.B. This TABLE and the fourth following will admit of a Comparison to each other, the Observations having been made by the same Person in the same manner.

Of the WINDS in DUBLIN;
from 1737 to 1746, inclusive.

	E.	N.E.	S. E.	N.	W.	S. W.	N.W	S.
1737	36	28	62	14	69	83	64	21
1738	12	24	54	20	92	100	61	42
1739	31	42	76	36	58	60	55	28
1740	25	53	73	38	42	83	75	13
1741	37	39	65	21	56	88	54	14
1742	54	44	55	22	58	72	59	16
1743	53	25	66	22	54	79	56	20
1744	31	37	58	25	59	85	78	14
1745	36	34	84	15	51	105	54	29
1746	19	52	95	15	52	104	80	24
Total.	334	378	688	228	591	859	636	221
Medium.	33 $\frac{4}{10}$	37 $\frac{8}{10}$	68 $\frac{8}{10}$	22 $\frac{8}{10}$	59 $\frac{1}{10}$	85 $\frac{9}{10}$	63 $\frac{6}{10}$	22 $\frac{1}{10}$

A Sum-

The WINDS of the several Seasons, during
the aforesaid Period.

	E.	N.E.	S.E.	N.	W.	S.W.	N.W.	S.
<i>Spring</i>	111	156	191	91	115	169	148	57
<i>Summer</i>	97	74	168	46	163	236	213	43
<i>Autumn</i>	66	81	159	58	151	212	146	63
<i>Winter</i>	60	67	170	33	162	242	129	58
Total	334	378	688	228	591	859	636	221

Western points.

W. 591
S. W. 859
N. W. 636

 2086

Eastern points.

E. 334
S. E. 688
N. E. 378

 1400

Compare the 1st and 2^d Table above, from which this differs in respect to the proportion of the Eastern point to the Western, being greater than in either of the two preceding Tables: but this is owing plainly to the unusual prevalence of the Easterly winds consequent on the great Frost 1739, and for the like reason the Northerly Winds do a little exceed the S. otherwise than in the two preceding Tables, even by reason of the great prevalence of the N. winds consequent on the same great frost for several

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veral

veral seasons: but this agrees to the 1st Table and to the subsequent Tables in the S. W. being the most predominant of all others, and next to this are the S. E. and N. W. being nearly equal, and somewhat exceeding the W. as in the 2d Table, and likewise here as well as in the 2d Table the E. N. E. S. E. and N. winds blow more in the Spring than in any other season.

In order for a further illustration of the history of Mock-suns, I shall here subjoin a third account of this Appearance, to be compared with those of 1744 and 1734 above.

April 19, 1746, on the road to *Bray*, the sun about 10 degrees high, between five and six in the morning, there appeared two large Mock-suns, one S. E. the other N. E. from the real Sun, and distant 10 degrees from the real Sun: they continued in the same elevation with the real Sun, till near eight in the morning, when clouds coming on darkened the first Mock-sun, then the real Sun, and that on the North side. It blowed hard at S. E. which brought on heavy clouds and violent rain near noon, which continued for that day and night, the next day and night, and the greatest part of the 21st.

The warmth the day before the great storm *November 22*, attended by a great abundance of Vapors, as appeared

peared by the hygrometre, was worthy of notice.

1747.

S P R I N G.

March.

Dry and frosty for the most part, more rarely warm and pleasant. From the 19th almost to the end frequent snows and some showers, and a little wind. The 26th windy at S. W. The pr. Winds at some point of the E. and sometimes of the N.

April.

Mostly fair and dry, and for the most part cool, void of the usual showers, except that it was a little cloudy and wet towards the end of the month. The reigning Winds S.E. next N.E.

May.

Generally fair and warm, with showers frequently interposed, the former attended with S.E. the latter with S.W winds,

S U M M E R.

June.

The first 6 days wet and cool, and the winds S.W. N. and N.W. Thence to the 22d mostly fair, and the pr. Winds S.E. and E. thence to the end cloudy and showery, with S.W. Winds.

July.

The first 6 or 7 days wet and cloudy, with N.W. and S.W. winds, the rest of the month unusually fair,

3 D 2 hot

August.

hot and dry for the most part, and the reigning Winds E. N.E. or S.E.

Remarkably hot and fair, and contrary to custom, hotter than *July*, and indeed one of the hottest *Augusts* in the memory of man. The pr. Winds S.E. E. or N.E.

A U T U M N

September.

Introduced as it were a sudden winter, and the general temperature of the weather was wet. The pr. Winds N.W. and W.

October.

The 4 first days cloudy and wet, but most of the month extraordinarily fair and summer-like: it concluded with rain and wind. The pr. Winds W. S.W. and N.W.

November.

Summer-like weather for the most part of the first 15 days: thence to the end of the month alternately wet, windy and frosty, and concluded with sleet. The pr. Winds S.W. and W.

W I N T E R. 1747, 1748.

December.

Frost at the beginning, then mild and fair, or a little gloomy, and sometimes a little rain, and some little frost thro' the rest of the month, which concluded with a cold S. E. wind. The pr. Wind S. E. next S. W.

January.

Unseasonably warm, and more serene than usual, and frequently more like

like *April* than *January*, and the Thermometre higher than in *December*, tho' not without the gloominess proper to the season interposed. Frosts but few: a few rainy days, viz. the 21st, 23d and 28th. The pr. Wind S. E. next N. W.

February.

Generally serene, cold and a good deal of frost and snow, and contrary to custom, colder than *January*. The 11th and 22d at night, and the 23d day rainy. The pr. Winds S. E.

S U M M A R Y.

Spring for the most part cold.

Summer hot and dry.

Autumn unusually fair.

Winter mild, save a frosty *February*.

O B S E R V A T I O N S.

In *England* likewise from *April* 28, the Summer, taken together, was the hottest of many years.

It is said that the defect of rain in *April* was partly supplied by Dews, and that these Dews came earlier in the year than since the great Frost 1739, which was followed by an unusual dryness for several years.

The fine weather of the month of *May* presented a prospect of plenty of grain and fruits, particularly of Apples this second year, contrary to custom,

custom, but the Apple-trees were blasted.

The fair weather in Summer continued the greatest part of 7 weeks; a series of unusual length in this Country. It was a fine season for all sorts of grain: and as the crops in *France*, *Spain* and *Italy* failed, some of those were supplied from *Ireland*.

I heard of a second crop of some fruits, particularly Apples or Pears, or both, in some places; and the fertility is said to have extended to the Animal; as well as Vegetable World; for it was observed that there were a greater number of women pregnant this year, and impregnations of some that had been long barren.

1748.

S P R I N G.

March.

Alternately wet, windy, fair, cloudy, cold and snow, succeeded by mild weather and changes of wet and dry. The Winds variable.

April.

The first 17 days for the most part unseasonably cold and dry, and a very backward Spring; little of falling weather, except Hail, which was frequent, and the Winds N. W. and N.E. Thence to the end of the month warmer, with frequent showers, and the Winds S.W. and S.E.

Rainy

May.

Rainy the first 11 days at times : thence to the 21st mostly fair : thence to the end of the month often cloudy and wet. Frequently very warm thro' the month. The pr. Wind S.W.

S U M M E R.

June.

Cloudy, windy and cool the first 6 days, and the Winds mostly S.W. thence to the end of the month very warm and dry, and the pr. Winds S.E. N.E. and E. Some rain at the end.

July.

Frequent and plentiful rain, and some Winds, particularly the 13th, 14th and 15th. The Thermometre lower than in *June* ; contrary to custom. The pr. Wind S.W.

August.

Fair, and fine harvest weather the first 15 days, and the Wind N.E. From the 15th to the 21st for the most part rainy, and the Winds W. and S.W. Thence to the end fair and the Wind S.E.

A U T U M N.

September

The first 15 days fair for the most part, and the pr. Winds Easterly. Thence to the end of the month clouds and rain were interspersed, and the Winds W. S.W. and N.W. Some days sultry, and some hot winds. A longer protracted Summer than usual. The 20th at night a great fall
of

of rain. The 29th and 30th stormy at W. and S.W.

October.

The first 9 days fair for the most part, and sometimes hazy, and the Winds variable: thence to the 14th mostly frosty, Winds N.W. Thence to the end frequent rains, winds S.E. and S.W. and it concluded stormy.

November.

Hazy for the most part, sometimes cloudy and mizzling: uncommonly warm for the season. A frost the 12th, 20th and 21st. The pr. Winds W. and S.W. It concluded windy.

W I N T E R. 1748, 1749.

December.

Windy with S.W. winds the greatest part of the month, not much rain. The 15th a deep snow, and in the night a storm, and the 16th a great fall of snow and fleet.

January.

The windy weather continued thro' the greatest part of the month, with S.W. and W. winds. Frequent storms, especially in the nights, particularly the 26th, with several shipwrecks. A good deal of rain and floods. The 11th and 12th at night Lightning, some little frost, snow and fleet, especially near the end, but of no duration.

February.

Windy at times the first 9 days, and the Wind S.W. Thence to the 17th a remarkable calmness and serenity succeeding the long storms, and the wind shifted to S.E. Thence
to

to the end cloudy and wet, and the Winds continued S. E.

S U M M A R Y.

Spring pretty feasonable.

Summer warm and dry for the most part.

Autumn uncommonly warm and summer-like.

Winter windy and warm.

O B S E R V A T I O N S.

In *November* was a second bloom of *Roses* and some other flowers, and *February* 5 *Primroses*, *Violets*, *Colt's-foot* and *Fumitory* were in flower.

We had an account from *Paris* that the *Thermometre* in *June* was higher than it had been these 100 years, and that some *Horses* dropt down dead by means of the violent heat. We had also accounts of *Damages* done and several *Persons* killed by *Lightning* in *England*, and of some damages by the *Lightning* in the country here ; and it was remarkable that the *Lightning* of the 11th of *January* was common to us and *London*. the same day, as was the storm of *December* 15, to us and *Plymouth*.

This month, viz. in *June*, we were alarmed at the arrival of some of the flying *Locusts*, being a large exotic

Grashopper. Their flight to us was favoured by the Easterly winds: and we have good authority for supposing these to have been the same with those that were taken in *England* this year, which having been compared with those that had been sent over from *Poland* and *Hungary* the same year, were found to be perfectly of the same kind (A), the Eastern parts of Europe, particularly *Poland* and *Hungary*, having been much infested by them, and their Vegetables destroyed by them, and they made great devastations in *Bohemia* and *Silesia*.

1749.

S P R I N G:

March.

The first 13 days moist, rainy and warm, then succeeded cold and dry weather, which lasted more or less to the end of the month: near the end it was less cold, and there was much more rain: the 26th a great flood. The pr. Winds S. E.

April.

Unusually cold for the most part; a good deal of rain and some hail. It concluded fair and warm. The pr. Winds S. E. and S.W.

May.

The first 9 days for the most part cold like *March*, and the 5th a great fall of snow. From the 10th to the 20th

(A) Phil. Transf. No. 491. p. 27.

20th a series of serene and very warm weather. Thence to the end, and especially since the appearance of a Mock-sun on the 23d, it again grew cold and winter-like, with rain and hail. Compare *April* 1746, and the Observations in 1734, and 1744. The Winds varied from S.E. to N.E. S.W. and N.W.

S U M M E R.

June.

The first 18 days cold and winter-like, and some hoar frosts in the morning, the Wind chiefly N.W. yet alternately fair and cloudy; except the wet and stormy weather following the Parhelion or Mock-sun, which appeared the 16th. From the 19th to the end fair and warm for the most part and the Wind S.W. and W.

July.

A little windy at the beginning; the first 13 days mostly fair. From the 14th to the end alternately fair and showery: The 18th and 24th much rain. The pr. Wind S.W.

August.

The foregoing half of the month was frequently cloudy, wet, cold and winter-like: the latter half generally fair, and fine harvest weather. The Winds S.W. and N.W. The 23d and 30th much rain. It ended cold and fair.

A U T U M N.

September.

A hasty onset of Winter as it were, the first 20 days mostly cloudy, a good deal of rain, and often cold almost to frost. The rest of the month partly serene and partly hazy. The pr. Winds N.W. S.W. and W.

October.

Except the first 6 days which were wet and windy, it was dry, hazy, mild and pleasant; sometimes a little frost, and it concluded warm. The pr. Winds N.W. S.W. and W.

November

A mild month as the former, and for the most part warm and calm: rarely frosty, viz. the 6th and 27th; a little windy the 24th and 25th. Rain the 5th, 7th and 8th. The Winds W. S.W. and S.E.

W I N T E R. 1749, 1750.

December

Mild thro' a considerable part of the month, little rain. The first 8 days mostly gloomy and pleasant: the 9th and 10th a glut of rain, which was succeeded by frequent frosts and cold weather, until near the end, which was mild. The pr. wind S.W.

January.

Mild for the most part, being alternately fair, hazy, foggy and cloudy, a little rain and wind, some slight frosts, and sometimes warm weather like spring. The pr. Winds S.W. S.E. and S. From the 25th to the end

end wet and windy, and the pr. Wind S. W.

February.

Very windy, frequently stormy and wet, the reigning Wind S. W. A few fair days. It concluded with snow and frost.

S U M M A R Y.

Spring cold.

Summer partly cold and winter-like.

Autumn mostly mild, warm and dry.

Winter mild and open.

O B S E R V A T I O N S.

In the North of *England* snow and ice of a great thickness was found in *June* in several places. It was an unkindly season by reason of the cold winds of the Spring, and the cold protracted to *June*, with regard to Hay, Apples and Wall-fruit.

Coals were at 48 s. per Ton.

A Diary kept by *Gilbert Jaffray*, at *King's-wells*, near *Aberdeen*, Lat. 57, from *October* to *March* 1749, furnished the following Observations, upon an accurate comparison with my Diary in *Dublin*, viz.

1. There was a remarkable harmony as to any notable storms, rain, heat or frost, which for the most part happened at the same time in both places.

2. There

2. There was much more rain in *Dublin* than at *King's-wells*.

3. The Winds in both places for the most part agreed, especially when they did set in from any point.

4. Here was considerably less frost and snow than there.

1750.

S P R I N G.

March. The first 10 days pleasant and mild, the rest of the month variable as usual, alternately windy, wet, hail and frost. The pr. Winds N. W. S.W. and W.

April. Alternately fair and cloudy, with a little rain interspersed, and sometimes hail; often cold, and sometimes frosty, but ended mild. The pr. Winds N. E. S. E. and N.W.

May. For the most part fair and extremely dry, and sometimes frosty in the mornings. The pr. Winds N. E. E. and S. E. The month concluded with showers and N.W. and Southerly winds. A backward Spring.

S U M M E R.

June. From the 17th to the 21st was the hottest weather in the memory of man, and *Fahrenheit's* Thermometre rose to 76, viz. as high as it is noted to have risen at any time in *Lord Anson's* voyage round the World, tho' in

in *London* it once rose to 78. But, notwithstanding this, before and after the above-mentioned time we had frequent rains, and it was very cold afterwards, and the Hygrometre was heavier than in *May*. The pr. Winds S.W. and N.W.

July.

The first 7 days it was frequently cloudy and wet. From the 8th to the 12th mostly fair and excessively hot: the Thermometre again amounting to 76. From the 12th to the 22d alternately fair, cloudy and wet: thence to the end frequent showers. The Dog-days cold. The pr. Wind S.W.

August.

A winterly month, the first half of it scarce a day without rain: the latter half it cleared up a little, but still rain was interposed. The Dog-days remarkably cold, but the month concluded sultry. The pr. Wind S.W.

A U T U M N.

September.

Pleasant, calm, fair and gloomy, and sometimes warm like summer, compensating as it were for the bad Summer, and the harvest good. The 2d, 12th, 14th rainy, else very little rain. The Winds mostly N. E. S. E. or N. W.

October.

Cool for the most part, cloudy and hazy by turns, and sometimes rain and

and snow, which fell in gluts at once, particularly the 7th and 10th, and the 23d at night was a vast fall of hail and snow, which was followed by a very smart frost, and uncommon so early in the season, lasting almost to the end of the month. The pr. Winds E. S. E. and N. W.

November.

Frequent frosts, with fogs and little wind: hazy and serene by turns. The 4th and 29th at night great gluts of rain. The 29th and 30th, a storm at S. W. The pr. Wind N. W.

W I N T E R. 1750, 1751.

December.

The first 5 days windy and wet: this was succeeded by warm, spring-like weather, and the Thermometre was considerably higher than in *November*. Foggy weather succeeded, and sometimes a little mizzling: a slight frost near the end. The pr. Winds S. E. S. and S. W.

January.

Extremely variable, cloudy, fair, wet, warm, cold, and frequent frosts, and snow, especially at the latter end of the month. The Winds variable. The 16th a violent storm from 12 of the clock until 3, followed by a great fall of rain.

February.

The first 8 days fair and frosty, with E. and S. E. winds; this was succeeded by alternities of windy and wet weather, and sometimes frost and hail, rarely serene: The pr. Winds the

February. the rest of the month S. W. and N. W. The 25 at night a great fall of rain and a violent storm, which did considerable damage, and was common to us and *York*, and *Nantz* in *France*.

S U M M A R Y.

Spring cold, dry and backward.

Summer, except a few excessively hot days, cold, moist and Winter-like.

Autumn variable.

Winter exhibited a good deal of frost and snow, except *December*.

O B S E R V A T I O N S.

There was much turbulent weather in *July* in *England*, *Germany*, &c. and great damages in *England* from Hail, thunder and lightening, all far less and more mild here.

The hot weather in *July* was common to us and *Norwich*, and several Horses dropt down dead under their masters, overcome by the heat.

At *Coolock* a village near *Dublin*, more wasps were observed this month than for 30 years past:

The early Frost in *October*, was common to us and the North parts of *Europe*.

In *Scotland* Birds nests with young birds hatched, were found in *December*.

We had an account from *Poland*, of the like change from warmth in *December* to extreme cold in *January*, as above.

March.

S P R I N G.

Windy, wet and cold, frequently hail and some frost. The pr. Winds W. and S. W.

April.

Cold for the most part with a prevalence of N. E. winds; some few days warm and pleasant. The Rains not so frequent, but more in glut than usual this month; *v. g.* the 10, 12, 14, 15, were rainy: else little rain.

May.

The first half of the month, alternately fair and cloudy, and sometimes windy and showers, frequently of hail, and mostly cold. The latter half of the month for the most part serene and warm. The 10, 12, 16, and 17, rainy. The pr. Winds N.W. S. E. and S. W.

S U M M E R.

June.

Fair and warm most of the first 12 days of this month with S. E. and N. E. winds. The 12 days remarkably hot, and the Thermometre at 76, but this of no continuance. A great droughth attended most of the month, notwithstanding that S. W. winds were frequently interposed. The latter part of the month generally cool, with E. and sometimes S. W. winds.

Fre-

July.

Frequent and plentiful rains, but few days entirely free from rain. The pr. Winds S. W. N. W. and S. E.

August.

The first 19 days for the most part rainy, thence to the end of the month generally fair. The pr. Wind S. W.,

A U T U M N.

September.

A rainy month, but a few fair days. Great gluts of rain the 20, 21, 22, and great floods. The pr. Winds S. W. W. and N. W.

October.

Mostly fair and pleasant, and the Winds mostly S. E. Slight frosts pretty frequent. The 25 and 26 a glut of rain with N. E. winds, and the month concluded with a smart frost.

November.

Hazy and foggy for the most part, and a little frost at the beginning and near the conclusion. The Winds mostly S. W. and W. The 16 at night, and the 17 and 21 Stormy; the 14 and 23 at night and 24 rainy.

W I N T E R, 1751, 1752.

December.

For the most part hazy, foggy, cloudy, or mizzling, and sometimes a little rain, and some frosts interposed. The 20 at night a great fall of rain. The pr. Winds N. W. and S. E.

January.

Hazy, dark and cloudy, the Sun rarely appearing. Frequent rains, particularly the 9, 10, 13 and 14.
3 Feb. and

and mostly with S. E. winds. The 19 and 24 Snow which was more frequently in the country. The pr. Wind S. E.

February. For the most part pleasant, fair and mild. The 12 and 14 at night rain, as also the 21. The 14 at night Stormy, as also the 26 th day. The pr. Winds S. W. and N. W.

1751.

SUMMARY.

Spring cold.

Summer wet.

Autumn variable.

Winter open, hazy, foggy and cloudy, and a fair *February*.

OBSERVATION.

The bad weather in *July* and *August* was common to us and *England* and *Germany*.

1752

SPRING.

March.

Cold and dry for the most part, and sometimes windy, frequent frosts, some hail and snow. The pr. Winds N. W. and N. E.

April.

For the most part extremely dry and cold, but few showers, and those frequently of hail, and the Winds mostly N. E. E. S. E. or N. W.

A moist

May.

A moist dropping month: a few warm days especially from the 9 to the 13: as also the 27. The pr. Winds S. E. and E.

S U M M E R.

June.

The prevailing weather was cloudy, wet, cool and winter-like, but a few fair and warm days. The pr. Wind S. W.

July.

Excessively wet, but very few days quite free from rain, which sometimes fell in great abundance, particularly on the 26. The pr. Wind N. W.

August.

Cloudy and wet weather prevailed, much rain the 11 and 24 at night, and the 25th day. The pr. Wind S. W.

A U T U M N.

September

The moist weather continued by intervals, thro' the greatest part of this month, and it was often windy. The pr. Wind S. W.

October.

Mild, serene and foggy, the Winds S. E. and S. W. The 8 at night, and the 13 at night a great fall of rain.

November.

Hazy, fair, foggy, and some slight frosts, and sometimes a little windy. Some rains, not frequent, but in great gluts, as the 4, 5, 9 and 24. The 10 a great fall of Snow. The pr. Wind S. W.

W I N.

W I N T E R. 1752, 1753.

December.

Hazy, foggy, little wind, frequent frosts, especially the latter part of the month. The 17 at night a storm succeeded by a great fall of rain and snow the 18 at night. The pr. Winds W. S. W. and N. W.

January.

Foggy, and frequent frosts, a few serene days, a little snow and frequent rains. The pr. Winds S. W. W. and S. E.

February.

Frost and snow very frequent, and great rains between whiles. The 12 a great snow. The 16 and 17 Stormy. The pr. Winds S. E. W. and S. W. It concluded fair with N. E. winds.

S U M M A R Y.

Spring cold and dry, except a moist
May.

Summer extremely wet,

Autumn for the most part mild
and dry.

Winter variable, Frost, snow, and
rain interspersed.

O B S E R V A T I O N S.

The Herbs were remarkably larger
this Summer than usual, from the ex-
cessive moisture of the season.

Also several plants flowered in an
unusual manner at the beginning of
Sep.

September the second time, from the abundance of the moisture, particularly the Scabious, the Eupatorium Canabinummas, the Corn-poppy, Eryngo, &c.

Several of the Grains were lean and poor, but the Potatoes were good.

A Rot appeared among the Sheep at the latter end of the season, and became general in the low and moist lands thro' most parts of the kingdom. Compare the account given in the Observations annexed to the year 1735 from whence it appears that wet seasons do not necessarily produce this disease among Sheep, which will further appear by observing that a general Rot, among the Sheep as I am well assured, did also prevail here A. D. 1716, after the great frost of 1715, 1716, and which indeed is said to have been more universal than this: for that destroyed the Sheep even upon the best lands: also A. D. 1708, was another great Rot among the sheep here, and likewise in 1740, both which two last years were remarkable for having been signally frosty, and consequently attended not with excess of moisture, but excessive dryness.

1753.

S P R I N G.

March.

The first 11 days for the most part dry with S. E. and N. E. winds, the rest of the month wet, so that there

was

was scarce a day without rain, and sometimes hail and slight frosts. The 15, 16 and 25 at night great falls of rain. The pr. Winds thro' the latter and greater part of the month S. W. and frequent squalls.

April.

The foregoing half fair, and showers interspersed, and those frequently of hail, with N. E. and N. W. winds. The latter part of the month warm with W. and S. W. winds, and rain at intervals, and it concluded windy.

May.

The first 9 days mostly fair, and the pr. Wind at some point of the E. Thence to the 21 cloudy and frequently showers, and cold, and the pr. Wind N. W. Thence to the end warm, fair and very pleasant, with Easterly winds.

S U M M E R.

June.

The first part of the month for the most part fair and hot: the last half it was often cold, cloudy and wet, with N. W. winds: else S. E. S. W. and N. E.

July.

The foregoing half of the month frequent rains, and scarce a day free from rain, and the pr. Winds S. E. and N. W. The rest of the month mostly fair, and the winds N. W. and N. E.

August.

During the first half of the month frequent rains, particularly a great fall the 4th at night and the 15th. The

The remainder of the month mostly dry, fair, gloomy, and sometimes cloudy and cool. The pr. Winds W. and S.W.

A U T U M N.

September.

A fine, dry and summer-like month, tho' it ended a little windy and wet, with S. W. Winds, which else were variable.

October.

The dry weather continued mostly thro' this month: several warm and summer-like days: there was but little rain even with the S. W. wind, which was the predominant; the 8th at night and 16th only rainy. It concluded foggy, inclining to frost, with N. E, and Northerly winds.

November

A little wet and windy at the beginning; afterwards frequent frosts throughout the month; the 1st, 25th and 26th wet and windy. The 22d and 23d warm: the Winds S. W. W. N. W. and Northerly.

W I N T E R. 1753, 1754.

December

The first 9 days mostly cold, foggy and frosty, and the Wind N. W. thence to the 26th rain frequent, and more than had fallen for several months past, the Winds W. and S.W. The 13th Floods. Near the end it was frosty again, with N.W. and N. E. winds.

January.

The first 24 days cloudy with frequent rains, particularly the 4th at night, and the 14th and 15th at night. Great inundations in the country; the Winds S.W. and W. The 10th

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3 G

a storm

Registry of the

a storm at S.W. From the 25th to the end a smart frost, the Wind N. W.

February.

The first 8 days cold and frequent snow and sleet: the rest of the month vicissitudes of cloudy, rainy and fair weather; the 12th stormy and rainy. The pr. Winds S.W. and N.W.

S U M M A R Y.

Spring seasonable, except a wet *March.*

Summer wet.

Autumn fair and dry, and at the end frosty.

Winter rainy, and great floods, and some frosts.

O B S E R V A T I O N S.

There was a fine crop of excellent Potatoes, as also of Flax, and of Corn, except Bere.

The Inundations above-mentioned were not peculiar to us; for the *Rhine* overflowed its banks *December 14*, and the 19th there were great floods near *Utrecht* in *Holland*; and *January 1* and *9*, were Inundations in *Scotland*, *Holland*, and *Germany*.

February 26, at eleven at night, a ball of fire was seen in the south part of the Hemisphere, near 20 degrees in altitude, which in an instant so enlightened the air that it was possible to read the smallest print; it continued between four and 5 seconds and then disappeared, leaving a great smoak behind it.—See a like appearance above in

in *March*, A. D. 1719, and in 1758, hereafter.

1754.

S P R I N G:

March.

The first 9 days serene, gloomy and foggy by turns. The rest of the month generally very cold, and unusually so for the season, except the 23d, which was mild. Frequent frosts, hail and snow. The pr. Wind, N. E.

April.

The first 14 days mostly fair, with a few clouds and showers interspersed, and the Winds variable. Thence to the 20th, very cold, and frequent hail, snow and sleet, and the Winds mostly N. W. thence to the end fair mostly, but some clouds and showers, and the Winds N. W. E. and S. E.

May.

Alternately fair, cloudy and showery and the pr. Winds E. and S. E. and it concluded fair.

S U M M E R.

June.

Extremely wet and windy for the most part; few days without rain, and great floods at the middle of the month, The pr. Winds W. and N. W.

July.

The first 6 days mostly fair, the rest of the month generally wet and very cold, especially in the nights. The pr. Wind W.

August.

The wet weather continued the first 8 days; the rest of the month mostly fair, and sometimes hot, but it concluded cold and a little windy. The pr. Winds N. W. S. E. and E.

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1754.

1754.

A U T U M N.

September.

Mostly fair and pleasant; and frequently warm like summer: fine harvest weather. The 10th, and 26th, at night rain. The pr. Wind S. E.

October.

The fair weather continued to prevail throughout the month, though sometimes interrupted: for from the 8th. to the 18th, and the 23d, 24th, and 25th, it was windy, and the 16th, early in the morning was a great storm. The 15th, and 30th, much rain. The 19th, 20th, 21st, sultry as in summer, with a heavy hygrometre, and the Thermometre higher than in *May*. The Winds W. S. W. and N. W.

November.

Fair throughout the month for the most part, and some Summer-like days, though sometimes cloudy and foggy: the 6th and 9th at night rain, and near the end a smart frost, for 4 days. The pr. Winds N. W. and S. E.

W I N T E R. 1754, 1755.

December.

The foregoing half of the month cloudy, wet, windy, fair by intervals, and sometimes foggy, and the pr. Wind S. W. The 8th, at night a great fall of rain: the latter half of the month hazy and foggy, rarely a little spitting, and the Winds generally S. E.

January.

Dry, cold and frosty for the most part and the pr. Winds S. E. N. E. and E. The month concluded with a smart frost, and an imperfect thaw with a N. W. Wind.

Frosty

February. Frosty for the most part throughout the month, and the Winds S. E. E. and N. E. The 19th, rainy. The 21st, 22d, 23d, a good deal of snow.

S U M M A R Y.

Spring variable, partly temperate, partly cold.

Summer wet.

Autumn fair and Summer-like.

Winter frosty.

O B S E R V A T I O N S.

In *March* I saw some *Phillyrea's* and *Hollies* quite burnt and dried in their leaves by the N. E. Winds, an effect seldom seen but in such a frost as that 1739, 1740.

In *April* about *London* it was much colder than here, and *Sweden* and *Denmark* at the same time had unusual frost and snow.

The Frost in *January* was less severe here than in *France*, *Holland*, *Germany* and *Venice*; and at *Paris* the Thermometre was lower than in 1740.

In *February* the *Danube* and all the great rivers of *Germany* were frozen over, and in *Prussia* some perished of the frost: and in *Germany* and the *North*, the Winter is said to have been more severe than in 1740 and 1709, and that many perished in the Snow.

1755.

S P R I N G.

March.

Frequent rains throughout the month, and rarely a day without rain, though no glut of rain: the weather mild, rarely

rarely snow or frost. It concluded warm and windy. The Winds variable.

April. The wet weather continued to prevail in this month, not many days without rain : some fine weather, but rarely : it concluded cold ; the pr. Wind S. W.

May. The first 16 days interchangeably fair and cloudy, and often rainy ; mostly cool, sometimes hail. Thence to the end mostly fair, warm and pleasant : the 30th rainy. The pr. Winds W. and N. W.

S U M M E R.

June. The first 4 days fair, with Easterly winds : The rest of the month for the most part cloudy, and often wet. The 7th, 13th, 19th, 29th, rainy. The Winds variable.

July. A very wet month : few days without rain or clouds ; the 2d at night, the 5th at night, the 8th at night, and the 15th at night, and the 19th and 21st days much rain. The Winds N. W. S. W. and W. It concluded fair.

August. The foregoing half of the month alternately cloudy and fair, the latter part more cloudy and hazy : cool in general. The 18th and 28th at night a considerable fall of rain. The Winds N W. and W.

A U T U M N.

September. Generally cloudy and frequent rains, and gluts of rain the 1st and 28th at night : the 15th and 16th Summer-like days, else very little harvest weather, and the month concluded wet and stormy : the pr. Wind S. W.

A dry

October.

A dry month, and some warm Summer-like days, a little windy at the beginning; then fair, and frequent frosts to the 18th; the rest of the month fair, foggy and hazy. The Winds N. W. S. W. and W.

November.

Hazy, windy and cloudy the first week, then frost, hail and snow to the 12th; the 13th and 14th much rain and floods, and wet and windy to the 24th. It concluded frosty; the Winds W. N. W. and S. W.

W I N T E R. 1755, 1756.

December.

Alternately rain and frost, and sometimes snow; the 11th, 14th and 15th gluts of rain; the 24th at night, stormy; the Winds S. W. W. and N. W.

January.

Rainy the greatest part of the month and from the 8th to the 11th, and from the 19th to the 25th windy; the 16th a smart frost; the Winds S. W. W. and N. W.

February.

Windy through the greatest part of the month; the 12th, at night a Hurricane, which did some damage; the windy weather was succeeded by a little frost, and foggy and fair weather; the Winds S. W. and W.

S U M M A R Y.

Spring wet.

Summer wet and cold.

Autumn inclined to wet, except Oct.

Winter wet.

O B S E R V A T I O N S.

The 1st of *September* also at *Edinburgh* was the greatest fall of rain ever remembered in that country.

1756.

1756.

S P R I N G.

March.

The first 18 days for the most part dry, thence to the 26th, frost, snow and hail : thence to the end cloudy and wet; the Winds S. W. N. W. W. and S. E.

April.

A very moist and cold month, frequent showers and gluts of rain and hail; the Winds mostly N. W. or some point of the E.

May.

The fore half of the month alternately cloudy, fair and sometimes showery, and very cold. The 12th, and 13th, perpetual rain with S. E. Wind of near 48 hours continuance : the 15th, a warm Summer's day : the latter half of the month mostly fair, and the Winds E. S. E. and N. E.

S U M M E R.

June.

A wet and cold month in general, and winter-like : few days wholly free from rain, the 17th and 24th at night great gluts of rain ; towards the end warmer and pleasant, the Winds S. W. sometimes S. E. but both attended with rain.

July.

The first 6 days mostly fair, the rest of the month cloudy, with showers interspersed ; and few entirely fair days, more rain near the end, particularly the 23d : the pr. Winds S. E. and N. E.

August.

The Winter-like weather continued the beginning of this month, then cloudy, gloomy and fair to the middle : thence to the end very frequent rains, and

and the streets dirty as in winter. The 22d at night a great fall of rain. The Winds variable.

A U T U M N.

September. Alternately fair and gloomy, and rains frequently interspersed. The 3d 5th, 14th and 22d much rain. The 25th, 26th, 27th, on a sudden, sultry and windy with a heavy hygrometre. It ended fair; the Winds mostly at some point of the E.

October. Scarce a day without rain, most of the month until the 22d; the 2d, 3d, 7th, and 19th, gluts of rain: the 2d at night a storm, but the 7th in the morning early, a great storm destructive to Men and Shipping. From the 22d to the end (except the 26th) dry and pleasant: the Winds mostly S. E.

November. Fair weather prevailed throughout the month; from the 18th to the 24th a frost; the 17th and 26th, rainy. It concluded mild and Summer-like; the pr. Winds N. W. and S. E.

W I N T E R 1756, 1757.

December. For the most part dry, either serene or foggy; the 4th, the 13th at night, and the 15th, rainy; some days pleasant like summer. It concluded frosty; the pr. Wind S. E.

January. The frosty weather continued thro' out most of this month, and there were frequent snows and intervals of thaws: also several gluts of rain, particularly the 9th at night, the 18th at night, the 21st, and 25th; the 12th, at night a violent storm at S. E. which did great

damage to the Shipping. The pr. Wind S. E.

February.

Frost and Snow at the beginning. The 6th at night a great fall of rain: fair afterwards most of the month, tho' sometimes cloudy and windy near the end. The pr. Wind S. W.

S U M M A R Y.

Spring variable.

Summer very wet.

Autumn variable.

Winter frosty.

O B S E R V A T I O N S.

In *April* were floods in several parts of *England*, and the same sort of weather was common to us, and *France*, *Flanders*, *Germany*, and *Sweden*.

During this Summer there was much more rain in and near *Dublin* than in divers parts of the country.

In *August* the river *Rhine* in *Germany* is said to have risen higher than ever in the memory of man. The apple-trees were generally blasted, and the fruit failed. The Vintage in *France* failed; and we had not in several places above one half or one third of a crop of Oats, but the Potatoes were excellent this year.

The state of the air and weather the 25th, 26th, 27th of *September*, with the state of the hygrometre at the same time, seems to indicate, in concurrence with other observations, an effervescence in the atmospherical fluid.

The Storm of the 2d of *October* extended to *Greenock* in *Scotland*, to *Penrith*

rith in *Cumberland*, to *Bath*, to *Aust* passage near *Bristol*, and to the *Texel* in *Holland*, in many of these places doing great damage to the Shipping, and occasioning the loss of many lives, and some were drowned in the bay of *Dublin*. It is said to have been as great a storm as that in *January* 1738, 1739, above-mentioned.

The frosty weather in *January* was common to us, and *England*, *Russia*, *Poland* and *Germany*, and on the 5th of this month at night it is said that at *Vienna* it appeared by the Thermometrie to have been colder by two degrees than in 1740, and as cold as in 1709.

There was a great scarcity of Corn both here and in *England*, not owing entirely to a failure in the crop, but more to a consumption of the grain in the distilleries.

I shall here annex a few other Tables, which, compared with the preceding, may serve as a mutual confirmation of the truth of the Diaries kept from which they were constructed, and throw some light on this intricate subject.

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T A B L E IV.

Of the WINDS in DUBLIN;
from 1747 to 1756, inclusive.

	E.	N.E.	S.E.	N.	W.	S.W.	N.W.	S.
1747	23	52	89	22	54	97	76	25
1748	18	50	86	22	60	119	70	15
1749	18	33	78	17	67	115	68	27
1750	28	42	67	29	57	93	87	34
1751	24	54	75	19	62	94	79	19
1752	24	26	64	7	70	93	76	18
1753	20	30	56	23	72	100	101	13
1754	28	33	86	20	74	72	77	10
1755	23	26	41	28	94	103	80	20
1756	37	35	84	22	46	81	74	19
Total.	243	381	726	209	656	967	788	200
Medium.	24 $\frac{3}{10}$	38 $\frac{1}{10}$	72 $\frac{6}{10}$	20 $\frac{9}{10}$	65 $\frac{6}{10}$	96 $\frac{7}{10}$	78 $\frac{8}{10}$	20

A SUMMARY of the respective WINDS
in each Season during the above Period.

	E.	N.E.	S.E.	N.	W.	S.W.	N.W.	S.
<i>Spring</i>	89	156	190	70	134	213	215	46
<i>Summer</i>	71	92	191	49	162	296	224	58
<i>Autumn</i>	47	79	139	57	207	221	189	41
<i>Winter</i>	36	54	206	33	153	237	160	55
Total	243	381	726	209	656	967	788	200

Weather.

413

Western points.

Eastern points.

W. 656
S. W. 967
N. W. 788

S. E. 726
N. E. 381
E. 243

2411

1350

T A B L E V.

Exhibiting the reigning Winds in each month during
the above 43 Years in one view.

	S.W.	W.	N.W.	S.	S.E.	E.	N.E.	N.
<i>March</i>	17	12	22	8	18	9	22	5
<i>April</i>	16	6	18	0	24	9	23	6
<i>May</i>	12	10	8	2	23	22	12	4
<i>June</i>	22	19	15	1	22	17	12	4
<i>July</i>	22	21	20	4	14	8	9	2
<i>August</i>	24	20	17	1	16	10	4	1
<i>September</i>	22	24	17	2	18	8	11	1
<i>October</i>	27	20	16	4	23	9	6	3
<i>November</i>	28	23	19	2	12	4	3	4
<i>December</i>	29	17	15	2	12	3	1	2
<i>January</i>	26	15	11	5	18	3	4	0
<i>February</i>	31	17	13	4	13	5	5	1
Total	276	204	191	29	212	107	111	33

OBSERVATIONS.

1. From this 5th Table comprehending the whole series of time of these Calculations, it appears that the S. W. is of all others the most predominant Wind.

2. In these two last Tables the N. and S. Winds are more near upon an equality than in some of the preceding Tables, the first a little exceeding the last.

3. In the 4th Table the proportion of the Eastern to the Western points is nearly the same as in the 1st and 2d.

4. In the 4th Table the N. W. and S. E. a little exceed the W. as in the 3d Table ; in the 5th Table the N. W. is a little less than the W. but the S. E. a little exceeds it.

5. In both the last Tables the E. and the N. prevail much more in the Spring than in any other Season.

6. In the 4th Table the S. E. Winds were nearly equal Spring, Summer and Winter,

T A B L E

T A B L E VI.

The Proportion of each WIND to the Sum of the whole Winds from the foregoing Tables, from the Observations made near LONDON and those near DUBLIN, comprehending above 60 Years.

English Tables	Gadbury	Say.	Short.	Irish Tables.	
The E. wind to the whole Winds	nearly $\frac{1}{7}$	$\frac{1}{9}$	$\frac{1}{23}$	The E. wind to the whole Winds.	Tab. 1. $\frac{1}{14}$ Tab. 2. $\frac{1}{10}$ Tab. 3. $\frac{1}{12}$ Tab. 4. $\frac{1}{17}$
N. E. to the whole Winds.	$\frac{1}{9}$	$\frac{1}{4}$	near $\frac{1}{8}$	N. E. to the whole Winds.	Tab. 1. $\frac{1}{11}$ Tab. 2. $\frac{1}{10}$ Tab. 3. $\frac{1}{10}$ Tab. 4. $\frac{1}{11}$
N. to the whole Winds.	$\frac{1}{11}$	$\frac{1}{10}$	$\frac{1}{9}$	N to the whole Winds.	Tab. 1. $\frac{1}{10\frac{1}{2}}$ Tab. 2. $\frac{1}{13}$ Tab. 3. $\frac{1}{17}$ Tab. 4. $\frac{1}{20}$
S. E. to the whole Winds.	$\frac{1}{30}$	$\frac{1}{14}$	scarce $\frac{1}{17}$	S. E. to the whole Winds.	Tab. 1. $\frac{1}{7}$ Tab. 2. $\frac{1}{8}$ Tab. 3. $\frac{1}{8}$ Tab. 4. $\frac{1}{8}$
W. to the whole Winds.	$\frac{1}{2}$	$\frac{1}{6}$	above $\frac{1}{8}$	W. to the whole Winds.	Tab. 1. $\frac{1}{4}$ Tab. 2. $\frac{1}{4}$ Tab. 3. $\frac{1}{7}$ Tab. 4. $\frac{1}{6}$
S. W. to the whole Winds.	$\frac{1}{7}$	$\frac{1}{3}$	$\frac{1}{4}$	S. W. to the whole Winds.	Tab. 1. $\frac{1}{3}$ Tab. 2. $\frac{1}{10}$ Tab. 3. $\frac{1}{11}$ Tab. 4. $\frac{1}{4}$
N. W. to the whole Winds.	$\frac{1}{9}$	$\frac{1}{10}$	$\frac{1}{3}$	N. W. to the whole Winds.	Tab. 1. $\frac{1}{6}$ Tab. 2. $\frac{1}{10}$ Tab. 3. $\frac{1}{10}$ Tab. 4. $\frac{1}{4}$
S. to the whole Winds.	$\frac{1}{44}$	$\frac{1}{18}$	$\frac{1}{10}$	S. to the whole Winds.	Tab. 1. $\frac{1}{47}$ Tab. 2. $\frac{1}{14}$ Tab. 3. $\frac{1}{18}$ Tab. 4. $\frac{1}{21}$

OBSERVATIONS.

N. B. Gadbury's and Say's Observations, both made at and near *London*, contain above 20 years, and mine in *Dublin* above 48. Dr. *Short*'s are from numerous registries in different parts of *England*.

I. These various Observations, how different soever they may appear at first sight, will however upon a more attentive examination, be found to agree wonderfully in several grand particulars of importance, and in others wherein they differ, serve to shew the specific difference of the two Climates deducible from the various proportions of the different respective winds in each; and this moreover is an argument of the general truth of these several Observations.

2. They all agree in this, that the S. W. is the grand Trade Wind of both *England* and *Ireland*, and most so of *Ireland*: the next in frequency in *England* is the W. The N. W. is also a frequent Wind in both, but a good deal more frequent here: but the S. E. is vastly more frequent here, according to all the observations (a particular argument of their truth) even double, treble and above Sextruple to what it is in *England*, and indeed here is, upon an average, a little more frequent than the W. Wind. Next as to the E. N. and S. points, the difference also is very considerable: for in two of the Observations out of three the E. there is much more frequent than here, and the N. E. in particular
was

was much more frequent, sometimes double and more to what it was here. The N. also is often double and more in the three *English* Tables, than in the *Irish*, and lastly, as to the S. it is observable that in *England* it is much rarer than the N. whereas at *Dublin* the S. is either a little more frequent than the N. or sometimes both are nearly equal.

3. In the last Century it was not only a prevailing opinion among the Vulgar, that the Winds were in some measure, under the direction of infernal spirits, but even some learned Divines have expressly acknowledged, that the Devil, as Prince of the power of the Air, had a power of raising Storms and Tempests; but whatever truth there may be in this subtle metaphysical point, we must from the authority of holy Scripture and Observation, acknowledge the superintendency of a Providence in these seemingly irregular commotions of our Atmosphere; See *Mark* iv. 37, 39. *Psal.* cxxxv. 7. *Prov.* xxx. 4. for besides that storms have their uses, it is evident from the above faithful collection of Observations, that there is a far greater regularity and proportion maintained between the several sorts of Winds than is commonly imagined, even in this variable Climate, as appears by comparing the observations of the preceding Tables, insomuch that for the most part the asperity of N. and E. blasts is ordinarily temper-

ed by the succeeding softness of the W. and S. and *vice versa*, so that for the most part, a wholesome temperature is maintained. On the contrary, whenever we observe the usual Harmony and proportion of the Winds and attendant weather to vary much, we may expect an unhealthy Season, as was notoriously the case in the excessive moist seasons preceding the great frost in 1740, and the no less unusually dry season and long continuance of N. E. winds succeeding the great frost for some years, compared to the different diseases attending those different seasons, as is observed in the proper place, which altho' necessary afflicting Dispensations and Chastisements of a stupid and sinful world, we have cause to acknowledge have been dealt out to us with a very gentle hand.

Here, viz. in Table V. in *March* we have most

N. E. and N. W. winds, and least S.

In *April* most S. E. and least S.

In *May* most E. and S. E. and least S.

In *June* most S. W. and S. E. least S.

In *July* most S. W. least N.

In *August* most S. W. least N. and S.

In *September* most W. least N.

In *October* most S. W. least N.

In *November* most S. W. least S.

In *December* most S. W. least N. E.

In *January* most S. W. least N.

In *February*, most S. W. least N.

Again :

Again: The S. W. winds reign least in Spring, a little more in Autumn than in Summer, and most of all in Winter, and supply us with the greatest part of our storms.

The W. Winds blow least in Spring, and less in Winter than in the Summer or autumnal quarter.

The N. W. with us blew least in Winter, but the S. most in Winter (and least in Spring) so that here are two reasons for the peculiar warmth of our Winters.

The S. E. most in Spring, least in Winter.

The E. reign by far the most in Spring, next in Summer, next in Autumn and least of all in Winter.

The N. E. most of all in Spring and least in Winter, a third reason for the greater warmth of our Winters.

The N. most of all in Spring, and least of all in the Winter quarter, a fourth reason for the warmth of our Winters.

1757.

S P R I N G.

March.

A wet month, but some frost, particularly the 4 th, 5 th, and 6 th and frequently hail, and two notable storms on the 15 th and 23 d which did considerable damage. A great glut of rain the 21 st and 24 th. From the 15 th till near the end windy. The pr. Winds W. and N. W.

April.

Variable, but with a prevalence of cold, and a very backward Spring:

3 I 2

the

Registry of the

the first 3 days wet and cold, thence to the end frequent rain and hail, and some snow. It concluded warm and fair. The pr. Wind S. W.

May.

For the most part dry and cool: from the 11 th to the 16 th showery, as also at the end. The pr. Winds N. W. W. and S. W.

S U M M E R.

June.

Generally fair, dry and warm, and the pr. Winds N. E. S. E. or E. The 2 d at night rain: also the 17 th 19 th and 20 th day, and the 22 d at night.

July.

Somewhat cloudy at the beginning: from the 7 th to the 13 th fair and hot, and the Winds for the most part E. The heat less after the thunder the 14 th. Thence to the end frequent rains, and plentiful the 18 th, 20 th, 23 d, and 26 th. The Winds otherwise than above S. W. W. and Southerly.

August.

Except the 7 th and 8 th days which were fair and hot, there were few days but cloudy or wet, or both: and the latter end was squally, wet and winter-like. The pr. Winds N. W. W. S. W. and W.

A U T U M N.

September.

Excepting the two first days, the weather was generally fair and dry, or gloomy and pleasant, with a prevalence of S. E. and N. E. winds.

October.

The dry weather continued thro' the greatest part of the month, so that there was very little rain except the

the 5th at night with a storm and on the 7th at night, but several Summer-like days and a few fogs and slight frosts at the latter end. The pr. Winds N.W. S.W. and W.

November.

After a series of near two months dry weather succeeded a winterly season of frequent rain and wind throughout the month after the 4th day: on the 10th dreadful thunder and lightning. The 15th and 19th stormy. The pr. Winds S.W.

W I N T E R. 1757, 1758.

December.

The moist weather continued most of the first 6 days, which was succeeded by gloomy, foggy, cloudy weather, with frequent slight frosts, and sometimes a heavy Hygrometre, with a high Barometre: pleasant for the season. The 4th perpetual rain: the 29th a Summer-like day. The pr. Winds N. W. and S. W.

January.

A dry month: the first 15 days, after a little snow at the beginning, mild, and alternately serene and cloudy, and sometimes a little wet: thence to the 24th frost and a little snow: thence to the end gloomy and pleasant for the season. The pr. Winds S. E. and S. W.

February.

The pleasant weather continued the first 6 days, which was succeeded by frequent rains, winds, some snow and frost thro' the rest of the month. The 8th and 12th stormy: the 19th a great fall of snow. The pr. Winds W. and S. W.

SUM.

Registry of the

SUMMARY.

Spring cold and backward.

Summer for the greater part cloudy and wet.

Autumn mostly dry and Summer-like.

Winter mild and open, with some frost and snow interperfed.

OBSERVATIONS.

At *Liverpool* and *Chester*, the storm on the 15th of *March* is described to have been a perfect Hurricane at the same time, and far greater there than here, and to have been the greatest storm that had been remembered these twenty years. It was said that, by examining the Wind-book kept at the Admiralty in *London*, in *April*, that the Wind has not blown so long from the West in one year since the days of *Queen Elizabeth*.

In *May* was a time of great scarcity: bread about 7 lb. and in the North $4\frac{1}{2}$ pounds for a shilling; and some few perished for want in this City.

In *July Fahrenheit's* thermometre rose to 73, a somewhat extraordinary height. The 11th, a very hot day, fell at *Leixlip* a Honey-dew.

In Autumn it appeared that the dearth above mentioned was artificial; for the farmers now began to open their hoards of Corn laid up in hopes of a greater advance of the price, of which, by the present prospect of a good crop, they were disappointed.

But

By the Lightning the 10th of *November* one of the pinnacles of *Christ-church* was thrown down, and the Iron work about the weather-cock lately gilded, was turned black.

The storm on the 19th of *February* attending the great fall of snow was common to us and to divers remote parts of this kingdom, and observed in *Yorkshire* at the same time.

S P R I N G.

March.

Variable mostly cold, and a backward Spring, with a prevalence of S.E. N.E. and E. Winds: frequent rains, and sometimes snow: The month concluded fair, pleasant and warm.

April.

Still cold, with a prevalence of E. S. E. and N. W. winds: alternities of fair weather and showers, and these often of hail or snow. The 12th, the 16th in the night, and the 20th plenty of rain. It concluded fair and dry.

May.

Fair and dry for the most part throughout the month, scarce any rain, (tho' there were great dews) except the great glut on the 30th with thunder. It was also very warm from the 18th to near the end, when it became somewhat cool, with the Winds veering to the W. and N. W. which else throughout the month were S. E. E. or N. E.

S U M M E R.

June.

Fair and dry most of the month, so that the 7th and 16th were the only days remarkable for rain; it was also

also frequently cold, and some days were winter-like, but the 25th and 26th very hot. The pr. Winds W. N. W. and S. W.

July.

Generally cloudy and wet : not many days free from rain : the 14th a glut of rain : some very few hot and sultry days, but more cool and winter-like. The pr. Wind N. W.

August.

Often sultry, gloomy and fair : also frequently rainy, especially in and near *Dublin*, where we had plentiful rains. The pr. Winds S. W. and N. W. It concluded fair and cool.

A U T U M N.

September.

A fine harvest month, mostly dry, pleasant and cool ; some little frosts, and the pr. Winds N.W. N. E. and N. The 2^d at night rainy, the 17th a great fall of rain, the 6th stormy.

October.

The dry weather continued to the 20th day of this month, except the 7th and 8th days which were wet : in the latter part of the period mentioned were frequent frosts. From the 20th to the end cloudy, wet and sometimes windy : the 27th at night a storm and much rain. The pr. Winds S. E. E. and N. W.

November

Frequent rains throughout the month : a good deal the 20th. Windy the 14th, 17th, 18th, 19th ; else cloudy and some little fogs, not long fair. The pr. Wind S.W.

W I N T E R. 1758, 1759.

December.

For the most part rain, and gluts of it the 11th, 17th, 20th and 26th at

The higheft and loweft Page 424

Taken

		Higheft			Loweft			Loweft.		
		l.	s.	d.	l.	s.	d.	l.	s.	d.
1716	May 12 Oâ. 27	1	4	9	0	12	3	1725—6	0	14 3
1716—17	Jan. 12				0	15	0	1726—7	0	12 3
1717	May 18	0	18	3				1727	0	13 0
1717—18	March 1	0	17	3					0	13 9
1718	Sept. 27				0	13	3	1728	0	15 0
1718—19	Feb. 7				0	15	6		0	16 3
1719	Dec. 12	1	0	6				1729	0	17 9
1720	April 2 Nov. 19	1	3	6	0	15	3		0	17 9
1721	May 20 Sept. 16	0	19	0					0	17 3
1722	Oâ. 8 Dec. 15	1	0	9	0	13	9	1730	0	15 6
1722—3	Jan. 12 }	1	0	0	0	14	0		0	14 3
1723	April 20 }				0	12	3	1731	0	17 0
	Nov. 16.								0	19 3
1723—4	Jan. 11				0	13	6	1732	0	14 0
1724	July 25	0	17	6					0	13 3
1725	May 1				0	15	6	1733	0	14 3
	July 17	1	4	6					0	16 0
								1732—3	0	16 0
								1733	1	15 6
								1733—4	1	12 6
								1734	all the Year.	
								1735		

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OF

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at nights. Windy for the most part from the 8th, to the 16th; a frost and some snow, from the 5th, to the 7th, the pr. Wind S. W.

January.

Very windy to the 17th, with very little interruptions, and showers were interspersed, and sometimes it blew a storm, particularly the 7th, 9th, and 13th, and it commonly blew chiefly in the mornings and nights; a warm month like Spring: after the stormy weather were fogs, but without frost; the pr. Winds S. W. and W.

February.

A fine dry month for the most part, and a good deal of it like summer: Windy the 5th, a little frost the 16th, 17th, 18th, the 25th, and 26th, much rain with S. E. wind. The pr. Winds S. W. and S. E.

S U M M A R Y.

Spring cold and dry.

Summer mostly wet.

Autumn dry and fair.

Winter open and mild.

O B S E R V A T I O N S.

There was much more rain in *Dublin* in *July*, and for some time preceding than in several parts of the country, as the County of *Kildare* and *Wicklow*: and it is remarked that in *London* there fell in *July* five inches depth of rain, as a quantity surpassing any in the same month perhaps in the memory of man.

November 26th, about 15 minutes past eight in the evening, appeared a globe of fire, about 17 degrees above the horizon, due E. as large in appearance as the moon, but more of a golden colour, and continued above 3 seconds. It broke and di-

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spersed,

A U T U M N.

September.

Generally fair, with excellent harvest weather.

October.

Partly fair, and sometimes hot, like Summer, else variable with some glutts of rain.

November.

Moderate and mild, alternately gloomy and fair, with some frosts.

W I N T E R. 1759, 1760.

December.

In general was cloudy and gloomy: a few fair days, some frosts, but more moist fogs; the 25th at night a storm.

January.

Frequent rains, some floods, fleet and snow.

February.

Extremely variable, frequent rains and floods, some frosts and fogs; the 15th a great fall of snow: several fair days, often windy: it ended fair, calm and mild.

S U M-

Winds.			
S. E.	8	W.	9
E.	8	S. W.	4
N. W.	4	S.	2
N.	1		
N. E.	1		
22		15	
N. W.	4	W.	11
S. E.	6	S.	3
N.	2	S. W.	10
N. E.	4		
E.	1		
17		24	
N. W.	7	W.	11
S. E.	5	S. W.	3
N.	3	S.	3
N. E.	2		
17		17	
N. W.	3	W.	4
N.	1	S.	1
N. E.	6	S. W.	3
E.	4		
S. E.	9		
23		8	
N. W.	4	W.	5
S. E.	5	S.	1
N. E.	5	S. W.	7
E.	5		
19		13	
N. W.	10	W.	10
E.	1	S. W.	9
S. E.	4		
N. E.	2		
17		19	

S U M M A R Y.

Spring mostly fair and dry.

Summer mostly fair, dry and warm

Autumn for the most part fair and moderate.

Winter variable, but more inclined to moisture.

O B S E R V A T I O N S.

The Apples, Pears and Plumbs were blasted, and there was not above one third of the usual quantity of Strawberries; the grain of this year was dry and excellent: the Apples were much better in quality, though less in quantity than last year, from the long continued fine weather meliorating the juices.

Though there does not appear to have been much frost in the city, there was more in the country, and still much more in *Holland, Germany and Italy*, where the Thermometre was as low as in the great frost in 1709, and several soldiers perished by it during the winter's campaign in *Germany*.

The 15th of *February* we had a great fall of snow, but the same day in several parts of *England*, as also in *Scotland* and *Holland*, was a terrible Hurricane, which did great damage, but was not felt here, though some degree of it was observed at *Cork*.

S P R I N G.

1760.

S P R I N G.

March.

Uncommonly fair, dry and dusty, and in a great measure, free from rain and wind; sometimes like summer; a few frosty mornings in the country.

April.

Mostly fair and dry: it ended cold.

May.

Variable as to heat, cold and serenity, sometimes warm, then suddenly cold.

S U M M E R.

June.

The fore part mostly fair, with some hot days, the rest of the month for the most part wet and winter-like.

July.

Generally fair and dry, more rarely cloudy and a little rain: a few hot days.

August.

The 3 first days fair and warm, then some gluts of rain: the rest of the month for the most part fair and inclined to cold.

Winds.

N. W.	11	S. W.	3
N.	3	W.	5
E.	4	S.	2
S. E.	4		

22 10

E.	4	S. W.	8
S. E.	3	W.	8
N. E.	8	S.	2
N. W.	2		

17 18

E.	5	W.	4
S. E.	10	S. W.	7
N. E.	7	S.	2
N. W.	4		
N.	1		

27 13

E.	5	S. W.	6
S. E.	8	S.	2
N. E.	5	W.	4
N. W.	8		
N.	2		

28 12

N. W.	11	W.	9
N. E.	3	S.	1
N.	4	S. W.	4
E.	5		
S. E.	3		

26 14

E.	5	S.	3
N. E.	2	S. W.	9
N.	1	W.	7
N. W.	9		

17 19

A U.

A U T U M N.

September.

The fore half of the month fair, and frequently hot, with much dew and S. E. winds: and thus ended a series of about a month's fair weather: the rest of the month frequent and great rains, and the Winds S. W.

Winds.

S. E.	15	W.	6
N. E.	1	S. W.	8
N. W.	2	S.	2
18		16	

October.

Frequent rains throughout the month, and some floods. It ended with a smart frost.

S. E.	2	W.	13
N. W.	10	S. W.	9
N.	1	S.	1
N. E.	1		
14		23	

November.

Moist, much rain, not many fair days: scarce more than 3 frosty; a storm the 6th.

N. W.	6	S. W.	2
S. E.	2	W.	18
N. E.	1		
E.	2		
N.	2		
13		20	

W I N T E R 1760, 1761.

December.

The excessively moist weather with high winds continued through this month, few days being wholly exempt from either: the 7th and 30th, a storm.

N. W.	2	W.	20
N.	1	S. W.	10
3		30	

January.

A month of fine weather, uncommonly warm for the season; very little rain or wind: frequent fogs, but warm and moist, not attended with frost as usual.

N. E.	3	W.	6
S. E.	12	S. W.	9
N.	3	S.	1
N. W.	3		
E.	1		
22		16	

The

February

The fore-part variable: from the 11th to the end a good deal of rain and stormy weather.

SUMMARY.

Spring dry.

Summer variable, inclined to cold.

Autumn excessively wet.

Winter open, warm and windy.

OBSERVATIONS.

The Apple trees in *May*, after a plentiful blow, were blasted in our neighbourhood, but in *Munster* and *Ulster*, the blast was less injurious.

The 18th of *July* was excessively hot: *Fahrenheit's* Thermometre stood at 78.

Through the excessive moisture of the season a good deal of the Hay was rotted in *November*, and it is said to have bred worms.

By means of the long continuance of the Westerly winds *Dublin* was in a great measure deprived of Coals this winter, so that their price was advanced from 2 to 3 and 4*l.* per ton.

Primroses and Daisies were in blossom the 31st of *December*; and the 15th of *January* the Birds were singing.

1761.

SPRING.

March.

Variable: some slight frosts and often high Winds.

Mo-

Winds:

N. W.	7	W.	11
N.	2	S W	13
S. E.	1		

10

24

N. W.	8		
S. E.	5	S. W.	11
N.	3	S.	1
N. E.	5		
E.	1		

22

12

Weather.

433

April.

Moderate as to moisture or dryness:
rather cold for the Season :

May.

Rather fair than otherwise, great changes from heat to cold, so that our fires which had been put out the 7th were rekindled the 25th, and continued to the end of the month.

S U M M E R.

June.

For the most part dry, far less rain than usual, and yet it was rarely very hot, though the latter half of the month was hot ; the N. and E. winds prevailed, like what is more usual in Spring.

July.

The dry weather continued thro' the greatest part of the month, and it was rather cool than hot, though the 23d and 24th days were very hot and sultry, but no days within two degrees so hot as last year. Some S. Winds which were cold, dry and parching, contrary to custom.

Winds.			
S. E.	9	W.	10
N.	6	S. W.	3
N. E.	3		
N. W.	2		

	20		13
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N. W.	4	S. W.	8
E.	6	S.	1
N. E.	8		
N.	1		

	19		9
--	----	--	---

N. W.	3	W.	9
N. E.	9	S. W.	4
N.	5	S.	1
E.	2		
S. E.	4		

	23		14
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S. E.	4	W.	18
N.	1	S. W.	9
N. W.	8		

	13		27
--	----	--	----

The dry weather prevailed also thro' this month, but it was often cloudy and overcast, so that the heat was tempered, altho' about the middle of the month there were some hot and sultry days.

A U T U M N.

September.

The dry weather continued to prevail in *September*, tho' now and then interrupted by rain and some hard gales. The 14th a sudden change to cold, which continued about a week: thence to the end frequent fogs, and it was warm like summer.

October.

Abundance of rain, contrary to custom, and the greatest gluts of rain were from the E. It was cool: there were some hard gales: the 22d and 28th stormy. It concluded with a slight frost.

November.

Variable, with a few slight frosts and frequent rains. The 19th, 20th and 21st stormy.

W I N T E R. 1761, 1762.

December.

Fogs uncommonly frequent, and those not attended with frosts as usual, but moist, and often ended in rain. A few slight frosts, and on the 17th a considerable fall of snow.

January,

Winds.

N. W.	5	S. W.	11
E.	3	W.	8
S. E.	2	S.	2
N. E.	1		
N.	1		
12		21	

N. W.	6	S.	3
S. E.	9	S. W.	8
E.	1	W.	5
N.	1		
17		16	

S. E.	12	S.	2
N. E.	4	S. W.	2
E.	5	W.	5
N.	2		
N. W.	3		
26		9	

S. E.	4	W.	9
E.	2	S. W.	7
N. E.	1		
N. W.	6		
13		16	

S. E.	7	W.	9
E.	1	S. W.	7
8		16	

January,

For the most part dry, frequently windy: the 16th, 17th, 28th stormy. A few slight frosty mornings.

February

Was also for the most part dry: frosts, snow and sleet pretty frequent. Great variations of heat and cold this and the preceding month. The 16th and 17th warm and sultry like summer.

S U M M A R Y.

Spring dry and cool,

Summer extraordinarily dry.

Autumn variable, except a wet *October*.

Winter mostly dry, frosts moderate the two last months.

O B S E R V A T I O N S.

In *March*, Coals in *Dublin* were at 3*l.* per ton.

The extraordinary Drought of the Summer was common to us, and to *Italy* and *Switzerland*, and the great Rains in *October* were not peculiar to us, but, according to the public accounts, prevailed also in *Lancashire* and *Yorkshire*, and at or about *Venice* and *Rome*.

It was also observable that the most extraordinary fogs which attended us in *December*, were common to us and *London* at the same time.

Winds.

N. W.	3	W.	12
N.	1	S.	2
		S. W.	11

4	25
---	----

N. W.	10	W.	5
N.	3	S. W.	8
E.	1	S.	1
S. E.	1		
N. E.	2		

17	14
----	----

On the other hand, it may be worth observing that the 11th and 12th of *January* there was a violent storm in *Wiltshire* and *Lincolnshire*, but with us at the same time only smart gales at W. and S. W. with heavy showers.

Again, the 21st of *February*, there was a violent Hurricane in the N. and S. of *England*, having been felt from *Bath*, to *Leeds* and *Newcastle*, which was hardly, or but slightly felt here; instances among many others, of the happiness of our climate in an exemption from those violent storms of wind, thunder, lightning and hail, which frequently distress our neighbours.

1762.

S P R I N G.

March.

Was a wet month: not many days free from snow, sleet or rain; more snow and colder than for many years past. Some brisk gales now and then: the 15th a storm.

April.

Dry for the season, only a few showers now and then: cool and calm, yet a few fair days.

May.

Winds.

N. E.	4	W.	4
S. E.	7	S. W.	4
N. W.	13	S.	1
E.	1		
N.	3		

28 9

S. E.	9	S. W.	6
N. E.	4	W.	4
E.	5	S.	2
N.	2		

20 12

Weather.

437

May

Was an excessive dry month, hotter than for some years past, tho' with a cold wind at the same time, till near the end, when it was very warm.

S U M M E R.

June.

Generally dry and fair and warmer than the same month for several years past. Often windy, not much rain.

July.

The dry weather observed in the two preceding months continued in a manner somewhat extraordinary thro' this month, and even the S.W. winds were not attended with much rain except on the 8th. From the 9th to the 15th hot, yet no one day so sultry as in July 1760, by $1\frac{1}{2}$ degree of the Thermometre.

August.

Alternately fair, gloomy and cloudy, there were some great gluts of rain after the long droughth. It was not so warm as this month usually is. It concluded fair and cold,

Winds.

N.	2	W.	5
E.	12	S.W.	5
S.E.	4		
N.E.	8		
N.W.	1		

27 10

N.W.	13	W.	8
E.	3	S.W.	4
S.E.	5		
N.E.	1		
N.	1		

23 12

N.W.	6	W.	10
S.E.	8	S.W.	15
E.	1	S.	1
N.E.	1		

16 26

N.W.	11	W.	10
E.	8	S.W.	5
N.E.	9	S.	1
S.E.	2		

30 16

A U-

A U T U M N.

September.

A wet month, and not quite so warm as usual: the pr. winds S. W. and sometimes high.

Winds.			
N. W.	4	W.	10
S. E.	5	S. W.	17
E.	1	S.	4
N. E.	1		
		11	31

October

Was also a wet month, attended with great floods, common to us and several parts of *England* at the same time; cold for the season, tho' but little frost. The 20th a storm at E. It concluded frosty.

N.	6	S. W.	4
N. E.	10	S.	1
N. W.	5		
S. E.	8		
E.	6		
		35	5

November.

Alternately fair, cloudy and foggy. From the 11th to the 16th frosty. It ended warm like summer. A few smart gales.

N. W.	4	S. W.	11
N.	3	W.	7
N. E.	1	S.	1
S. E.	3		
		11	19

W I N T E R 1762, 1763,

December.

Generally foggy, warm and dry, little fun, little wind and little frost: the 3 last days a little snow and sleet, with brisk gales at S. E.

E.	2	S.	3
N. E.	5	S. W.	1
S. E.	14		
		21	4

January.

The weather was much like that of *December*, viz. dry, foggy, few frosts, and of short duration, and the S. E. winds still continued to prevail.

S. E.	19	W.	4
E.	5	S. W.	3
N. E.	2	S.	4
		26	11

February.

February.

Alternately cloudy, foggy, fair and mild, and there were frequent rains : the 11th a heavy shower of snow.

Winds

S. E.	9	W.	4
N. W.	2	S. W.	12
N. E.	4	S.	1
N.	3		
E.	1		
		19	17

S U M M A R Y.

Spring dry.

Summer dry.

Autumn moist.

Winter foggy and warm, with an unusual series of E. ly. winds.

O B S E R V A T I O N S.

The excessive drouth of the season was common, not only to us and several parts of *England*, but to other parts of Europe, and even to *Virginia*. In consequence hereof there was not above one third of the usual quantity of Hay, our Butter was scarce and ill tasted : there was plenty of Apples and Haws : the Wheat promised a solid, plentiful grain, the Oats a poor one.

The depth of Rain collected in *November* was only $7\frac{5}{16}$, whereas in *October* it was $26\frac{7}{16}$, and in *September* $19\frac{1}{16}$; but it is to be noted, that, altho' the quantity of rain was so far less in *November* than in the two preceding months, yet it appeared by the hygrometre that the quantity of watery vapors suspended in the air, was considerably greater in *November* than in the two preceding

ceding months, the weight of the Sponge in *November* having been 391 grains, which in *September* and *October* was but 347, the great moisture accumulated in the two last months having not been dissipated by the sun, nor by the usual ventilation by storms.

October 21, the *North-wall* near *Dublin* was overflowed, and some bridges were broken down, and several of the lower parts of *Dublin* were under water, and about the same time there was a prodigious swell of the river *Thames*, and great damages were done at *Norwich* by the floods, and from almost every quarter in *England* we had accounts of great losses of cattle and of divers manufactures by the same means: and moreover, about the same time were great storms with us in *Dublin* the 20th of *October*; at *Waterford* and the Co. of *Galway* at S. E. the 22d, blowing up by the roots trees of 30 or 40 years old: and at *London* the 21st in the evening was a storm which did great damages.

At the beginning of *January* we had a smart frost, but far less severe and of shorter duration than in *England*, *Holland*, *France*, *Germany* and *Italy*; and at *Vienna* *Fahrenheit's* thermometre was at the same height as in the great frosts in 1709 and 1740. *Cornwall* and some parts of *Wales* enjoyed a like exemption from the severity of this frost that we did.

By

By reason of the uncommon prevalence of the S. E. Winds in *January*, *Bristol* fair was this month deprived of its usual supply of Linnens from *Dublin*;—a rare event.

1763.

S P R I N G.

March.

Mostly mild and dry; a few frosts in the mornings, particularly from the 11th to the 15th some brisk gales.

Winds.

N. W.	6	W.	11
S. E.	5	S. W.	10
E.	5	S.	1
N. E.	2		
N.	2		
20		22	

April.

Alternately fair and cloudy, with frequent rains and some sharp weather and hail interspersed, and it ended cold with Northerly Winds.

S. E.	9	W.	12
N. W.	6	S. W.	5
N. E.	3	S.	1
E.	4		
N.	2		
24		18	

May.

Very dry and cool for the season, especially at the beginning.

N. W.	5	W.	7
S. E.	11	S. W.	7
N.	6	S.	1
E.	5		
27		15	

S U M M E R.

June.

Frequent showers, especially from the 9th to the end: generally cool for the season.

S. E.	10	W.	4
E.	8	S. W.	4
N. E.	11	S.	1
N. W.	3		
N.	1		
33		9	

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3 M

July,

July.

A very wet month, and for the most part cold, the thermometer lower in this month than for many years past. Several smart breezes.

Winds:

E.	1	W.	5
S. E.	10	S. W.	17
N.	1	S.	1
N. W.	6		
N. E.	2		

20	23
----	----

August.

The rainy weather continued to the 20th, during which time there was scarce a day free from rain: from thence to the end mostly fair.

S. E.	5	S. W.	16
N. W.	5	W.	10
E.	1	S.	6

11	32
----	----

A U T U M N.

September.

Alternately cloudy, gloomy and fair, with a little rain interspersed, but not much, except on the 1st and 19th. Cool for the season.

S. E.	5	W.	10
N. W.	3	S. W.	7
N.	2		
N. E.	6		
E.	2		

18	17
----	----

October.

The 2d and 3d days of *October* were memorable for the storm at N. E. and a vast fall of rain and great floods common to us and *Great-Britain*, otherwise it was a pleasant month, and mostly fair, with several summer-like days and some little frosts; yet the Hygrometre was considerably heavier than the last month, the moisture from the floods having not been exhaled.

S. E.	9	W.	5
N. E.	5	S. W.	9
N.	1	S.	1
N. W.	7		
E.	4		

26	15
----	----

November

November

Mild, dry and fair, with alternities of cloudy and hazy weather. The 18th a smart frost; the 19th a deep snow: the 26th rainy. The 2d and last windy.

Winds.

N. W.	6	W.	12
E.	5	S. W.	9
N.	3	S.	2
S. E.	2		
N. E.	1		
		17	23

W I N T E R 1763, 1764.

December.

There was a great storm the 1st, the 28th and 29th. The rest of the month was remarkable for the great quantity of rain that fell, being more than what had fallen in the same space of time for many years. The great quantity that fell on the 12th. was not equal to that of the 2d of *October* last, but both were attended with a N. E. wind; but the depth of Rain this whole month was much greater than in *October*, when the depth was but $20\frac{1}{10}$ inches, whereas in *December* it was $33\frac{1}{10}$ inches. There was some snow and fleet, and a few fair days.

S. E.	4	W.	6
N. E.	6	S. W.	11
N.	1		
N. W.	7		
E.	1		
		19	17

January.

The beginning was frosty, the rest wet and stormy, with great floods, which were common to us and most or all parts of Europe, being an extraordinarily moist season; some few frosts.

E.	1	S. W.	16
S. E.	1	W.	13
N. E.	1		
N. W.	4		
N.	1		
		8	29

. 3 M 2. *February*

February.

Frequent rains, some hail and storms and frosts, and the month ended with a great fall of snow for several days, with N. E. winds.

Winds.

S. E.	3	W.	12
N. W.	2	S. W.	12
E.	2		
N.	1		
N. E.	5		

13

24

S U M M A R Y.

Spring for the most part mild.

Summer wet and cool.

Autumn variable.

Winter wet, with great floods and storms.

O B S E R V A T I O N S.

The latter end of *April* an insect called a Fly, (but more properly a Flea, for it hops) destroyed great part of the seedling leaves of the Turneps in several places near *Dublin*. For prevention, it is proposed that an ounce of flower of brimstone be well mixed with three pounds of the Turnep-seed, previous to the sowing.

August 31, at *Kinnegad* fell Hail said to be as big as a musket-shot, and that much glass was broken by it;—an uncommon event here.

October 2d and 3d were memorable for a great storm at N. E. common to us and *England* and *Scotland*, doing great damage to the shipping in several parts of *England*, and

and withal, a prodigious fall of rain and great floods, and vast havock of the bridges here, and in different parts of the kingdom, it being one of the greatest floods in the memory of man. The depth of rain in my measure in one day, $11\frac{2}{5}$ inches, upon a review of several years past, appears to have been near treble to what we here commonly call a great fall of rain.

In the month of *October* was a second crop of Beans, Apples and Pears near *Dublin*.

In the storm on the first of *December* many persons in the harbour were drowned; and a house on *Ormond-quay*, having high chimnies, was blown down, and several persons killed. It reached the remote parts of *Ireland* and *Holyhead*. It was a little later in and about *London* (the Wind with us Westerly) viz. *December* the 2d, and in *Cambridgeshire* *Yorkshire* and *Newcastle*, and many lives were lost.

The excessive floods and storms (with more damages in the destruction of bridges) extended to *England*, *France*, *Italy* and *Germany*, where the *Rhine* overflowed its Banks.

1764.

S P R I N G.

March.

Mostly dry and fair : much March
dust : a little snow sometimes at the
beginning : some brisk gales at S.W.

Winds.

N. E.	9	W.	2
N. W.	4	S. W.	12
S. E.	6		
N.	1		
E.	1		

21	14
----	----

April.

Mostly dry and cool ; not so fre-
quent showers as usual : some few
summer-like days, and some few
snow and hail. Brisk gales at the
beginning and end.

S. E.	10	S. W.	7
N. E.	6	W.	5
N.	5		
N. W.	7		
E.	2		

30	12
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May.

Generally dry : now and then a
little rain : cool for the season : some
showers of hail : the 25th hot.
Windy about the beginning.

S. E.	7	S. W.	20
N. E.	3	W.	5
N. W.	6		
N.	2		
E.	2		

20	25
----	----

S U M M E R.

June.

Variable, but rather inclined to
wet : the first 6 days fair, thence to
the 22d alternately fair and cloudy.
The 7th, 23d, 25th, 28th, plenty
of rain from the S. E.

N. W.	2	W.	10
N. E.	3	S.	1
N.	1	S. W.	5
E.	8		
S. E.	14		

28	16
----	----

July.

Frequent rains throughout the
month ; the 17th and 30th much
rain ; some few sultry days, else cool
for the season. Some brisk gales.

S. E.	7	S. W.	13
N. W.	5	W.	12
N.	2	S.	1
N. E.	4		
E.	5		

23	26
----	----

August.

August.

The weather continued to be cool and moist, with frequent rains till the 20th: thence to the end mostly fair and warm: the 28th rain.

Winds:			
N.W.	6	W.	9
N.	2	S.W.	10
E.	2	S.	1
N.E.	2		
S.E.	11		
23		20	

A U T U M N.

September.

The fair weather of near three weeks of last month continued in some measure to the 8th of this; soon after rain, wind and cold weather succeeded. The 13th, 14th and 15th stormy and wet, the rest of the month variable.

N.	5	S.W.	13
E.	3	W.	13
N.W.	6		
N.E.	1		
15		26	

October.

Cloudy, wet and alternately fair, sometimes frosty. There was a sudden onset as of winter, yet the 21st was sultry. Smart gales frequently.

N.W.	13	W.	13
N.	4	S.W.	10
		S.	3
17		26	

November.

Alternately hazy, cloudy, wet and fair: the 8th and 10th much rain. Some brisk gales the fore part of the month; about the middle frost, and some showers of hail: thence to the end cloudy and moist.

N.W.	4	S.W.	3
S.E.	4	W.	8
N.	6		
N.E.	6		
E.	6		
26		11	

W I N -

W I N T E R. 1764, 1765.

December.

A warm month for the season, tho' not wholly without frost or snow, the last particularly on the 19th. Frequent fogs of the moist kind, and alternately cloudy, wet and fair, not much rain except on the 4th and 6th. The 5th, 6th, 7th and 18th stormy. The pr. Winds S. E. next S. W. both moist.

January.

Generally moist and warm, a good deal of rain and floods, very little frost; tho' frequent fogs. Smart gales the 9th, 11th, 16th. It ended fair and summer-like. The pr. Winds S. E. and S. W. as last month, and both equally moist.

February.

Very cool, with abundance of snow, much more than for many years past; also frequent frosts and some hail. The 26th a brisk gale at S. W.

Winds.

S. E.	14	S. W.	9
E.	5	W.	5
N.	1	S.	1
N. E.	2		
		22	15

S. E.	12	W.	3
E.	1	S. W.	12
N.	1		
N. W.	2		
		16	15

S. E.	10	S.	3
N.	3	S. W.	6
E.	3	W.	3
N. W.	5		
N. E.	1		
		22	12

S U M M A R Y.

Spring mostly dry and cool.

Summer cool and moist.

Autumn variable.

Winter warm and moist, except

February.

O B-

OBSERVATIONS.

The Winter was so warm that a Butterfly alive was exhibited to a society of Virtuosi in *December*; and on the 5th of *February* a cherry-tree were in blossom at *Kent*; — and a Thrush's nest was seen with young ones hatched.

The rains and floods in *January* were common to us and some parts of *England, France, Germany* and *Italy*.

1765. S P R I N G:

March.

Variable, as usual; frequent frosts, hail and snow; also frequent rains and stormy weather. The last week a change to a warmer state.

Winds.

N.	5	W.	9
N. W.	8	S. W.	14
E.	1		
N. E.	3		
S. E.	4		
21		23	

April.

Frequent rains throughout the month, and from the 5th to the 10th very windy.

S. E.	3	W.	3
N. W.	4	S. W.	
N. E.	5	W.	11
N.	2		
E.	4		
18		20	

May.

Mostly fair and dry: there were but few hot days, viz. the 7th, 12th and 13th; some sharp cold ones, some hoar frosts, and a smart shower of hail the 24th,

N. E.	8	W.	4
S. E.	12		
E.	3		
N.	3		
N. W.	6		
32		4	

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SUM.

S U M M E R.

June.

The dry weather that attended *May* continued thro' the greatest part of *June*; tho' there was a little more rain in this month.

Winds.			
E.	5	S. W.	6
N. E.	2	W.	5
S. E.	6		
N. W.	9		
N.	1		
23		11	

July.

The dry weather continued thro' *July*. It was cool to the 11th or 12th, thence to the end mostly warm. Some brisk gales the 7th, 8th and 25th.

N. W.	8	W.	13
S. E.	10	S. W.	5
N.	2	S.	1
20		19	

August.

The drought noted in the three preceding months continued to the 3d and 4th of *August*, when a little rain succeeded and was interspersed thro' the month, but in no great plenty. From the 19th to the 22d warm, sultry and moist.

S. E.	4	W.	7
E.	5	S. W.	11
N.	2	S.	3
N. W.	3		
N. E.	4		
18		21	

A U T U M N.

September.

Variable, serene, cloudy and frequent rains interspersed: some brisk gales, and the month ended with a storm. It was warmer than for some years past.

N. E.	2	S. W.	9
S. E.	5	W.	15
N. W.	5	S.	2
E.	1		
13		26	

October.

Variable, frequent rains, not much wind, except the 1st and 26th.

N. W.	7	S. W.	8
N. E.	1	W.	15
E.	2	S.	1
N.	2		
S.	2		
14		24	

No-

Weather:

451

November.

Fair for the season, very little rain, very mild, except some slight frosts and one shower of snow. The 25th at night a storm.

W I N T E R. 1765, 1766.

December.

Mostly dry, calm and foggy, with a good deal of frost. The 10th a glut of rain and a storm at night. The Winds more Easterly than usual this month.

January.

The frost mentioned last month continued to the middle of this, viz. about 18 days; the rest of the month gloomy, foggy and moist: very little wind, the Barometre very high.

February.

After some frost and snow intersperfed for several days, on the 11th, 12th, 13th, there fell a prodigious quantity of snow, attended with N. E. Winds. The rest of the month generally gloomy, hazy and foggy.

S U M M A R Y.

Spring variable, except a dry May.

Summer excessively dry.

Autumn variable.

Winter much frost and snow.

3 N 2

O B.

Winds.

N. W.	7	W.	5
N.	3	S. W.	12
N. E.	2		
S. E.	2		

14	17
----	----

S. E.	9	S. W.	7
N. W.	5	W.	6

14	13
----	----

S. E.	5	W.	12
N. E.	2	S. W.	4
N. W.	2		

9	16
---	----

N. W.	2	S. W.	6
N.	2	W.	7
N. E.	6		
E.	5		
S. E.	8		

23	13
----	----

OBSERVATIONS.

It was a backward Spring, and with the cold weather in *May* there was a blast upon the Yew, the Gooseberries and Apple-blossoms.

The extreme drought of summer was such that some trees dropt their leaves for want of moisture, and the Cattle wanted grass, to supply milk and butter for the poor; and what added to the distress of these, the Potatoes were scarce and small: also there were very few Apples, and Hay was scarce.

The Frost of this Winter was common to us and *Spain, Portugal, France* and *Germany*, where it was far more severe: for at *Ratisbon* on the 13th of *January*, it is said that *Reaumur's* thermometer was two degrees lower than in the severe frost in 1709.

In *February* was the greatest fall of snow in *Dublin* that any one remembers: several Cattle and some men were buried and lost their lives in the snow. It began in several places of *England* on the same day as it did here.

TABLE

* * * * *

I SHALL next give a Synoptic View of the state of the Winds in the different Seasons of the Years during the last 7 Years, viz. from 1759 to 1765 inclusive, drawn from the accounts annexed to each of the Months during that time, viz.

In the Spring the Winds from some point of the N. or E. to the Winds from some point of the W. or S. was as — 565 to 342,
i. e. as 100 to 60.

In Summer the proportion of the Winds from some point of the N. or E. to the Winds from some point of the W. or S. was as — — 513 to 442,
i. e. as 100 to 85.

In Autumn, the proportion of the Winds from some point of the N. or E. to the Winds from some point of the W. or S. was as — — 374 to 446,
i. e. as 100 to 119.

In Winter the proportion of the Winds from some point of the N. or E. to the Winds from some point of the W. or S. was as — — 335 to 351,
i. e. as 100 to 104.

Thus the general predominance of the N. and E. Winds in Spring appears, and that in Summer also the Winds from the N. and E. Quarters still prevail tho' less than in Spring: and our fine Weather in summer is ordinarily attended with Winds from the E. but in Autumn the Winds from the W. and

Now, as the temperature of the Weather is in a great measure determinable by the winds, from hence appears the reason of the temperateness of our Climate, the North and Eastern blasts being in every Season, though least in *Spring*, tempered by gentle Zephyrs, and the excess of cold or heat, corrected by it's succeeding contrary: but if at any time there should be a deviation for a considerable series of time to a cold and dry state, this becomes unnatural to us, as was notoriously the case in the great Frost 1740, and was attended with inflammatory diseases.

A SUMMARY of the various degrees of Moisture and quantity of Rain during the last 6 and 7 years.

N B. 1. The Hygrometre is a Sponge dipt in Brine and dried. — 2. The Year here begins in *March*.

A. D.		Gra.	A. D.		
1759	The Hygrometre was	3760	1760	The quantity of Rain was in inches.	165 $\frac{3}{10}$
1760		3901	1761		106 $\frac{2}{10}$
1761		3816	1762		106 $\frac{1}{10}$
1762		3724	~~1763~~		120 $\frac{2}{10}$
1763		3867	1764		~~121~~ $\frac{2}{10}$
1764		3902	~~1765~~		144 $\frac{2}{10}$
1785		3044			~~198~~ $\frac{1}{10}$

Hence it appears that, with respect to the different Moisture of different Years during a series of 7 Years, estimated by the quantity of watery vapor imbibed by the sponge, the greatest quantity having been 3902 grains,

grains, the least 3760, so that there is only a difference of 142 grains.

And, as to the quantity of rain falling at a medium during a series of 6 years, that it is never quite double in the wettest Seasons to what it is in the driest. Some Meteorologists have been a little too precise, in asserting that an equal quantity of rain falls in wet as in dry years; but this does not agree to my Observations: from which however thus much appears, as a miracle in nature, and an argument of the infinite power, wisdom and goodness of God, that the Rain is generally distributed with a divine Oeconomy infinitely transcending the utmost limits of human power and sagacity, so that it falls not as a deluge on one spot of ground, whilst another is deprived of it, but every field is supplied with such a proportion as to bring forth the vegetables proper to it, agreeable to the text in Job. xxviii. 24. *God looketh to the end of the earth, and seeth under the whole heaven: to make the weight for the Winds, and he weigheth the waters by measure: when he made a decree for the Rain, then did he see it and declare it, he prepared it and searched it out.*

But a clearer idea of the state of the Winds, and their several proportions to each other in the several Seasons, will be given by the following Tables constructed from the accounts annexed to each month during the last 7 years, which accounts were extracted from my Diary.

T A-

T A B L E VIII.

1759	E.	N.E.	S. E	N.	W.	S.W.	NW	S.
<i>Spring</i>	9	19	11	11	23	12	29	1
<i>Summer</i>	7	3	21	5	24	26	29	3
<i>Autumn</i>	9	7	19	6	31	17	15	8
<i>Winter</i>	10	13	18	1	19	19	17	2
1760								
<i>Spring</i>	13	15	17	4	17	18	17	16
<i>Summer</i>	15	10	11	7	20	19	17	16
<i>Autumn</i>	2	3	19	3	37	19	18	3
<i>Winter</i>	1	3	13	6	37	32	12	1
1761								
<i>Spring</i>	7	16	14	10	10	22	14	2
<i>Summer</i>	5	10	10	7	35	43	16	3
<i>Autumn</i>	8	5	25	3	19	17	15	5
<i>Winter</i>	2	2	7	4	26	26	13	3
1762								
<i>Spring</i>	18	16	20	7	13	15	14	3
<i>Summer</i>	12	11	15	1	28	24	30	2
<i>Autumn</i>	7	12	16	9	17	32	13	6
<i>Winter</i>	8	11	42	3	8	16	2	8
1763								
<i>Spring</i>	14	11	25	4	30	22	17	3
<i>Summer</i>	10	13	25	2	19	37	14	8
<i>Autumn</i>	11	12	16	6	27	25	16	3
<i>Winter</i>	4	12	8	3	31	39	13	0
1764								
<i>Spring</i>	5	18	23	8	12	39	17	0
<i>Summer</i>	15	9	32	5	31	28	13	3
<i>Autumn</i>	9	7	4	15	34	26	13	3
<i>Winter</i>	9	3	36	5	11	27	7	4
1765								
<i>Spring</i>	8	16	19	10	24	20	18	3
<i>Summer</i>	10	6	20	5	25	22	20	4
<i>Autumn</i>	3	5	9	5	35	29	19	3
<i>Winter</i>	5	8	22	2	25	17	9	0
Total	236	276	516	157	668	688	457	96

TABLE IX. Exhibiting the Number of Winds in each of the four Seasons in one View.

	E.	N.E.	S. E.	N.	W.	S.W.	NW	S.
<i>Spring</i>	74	111	129	54	129	148	126	18
<i>Summer</i>	74	62	134	32	182	199	139	29
<i>Autumn</i>	39	51	108	47	200	165	119	31
<i>Winter</i>	39	52	146	24	157	176	73	8

From these Tables compared with those above from the year 1716 for above forty years preceding, appears the wonderful harmony between these registries made by different persons through all the varieties of weather attending, and from this comparison the following inferences may be drawn.

1. That the S. W. and W. winds are the two grand trade winds or reigning winds of this island, blowing most in Summer, Autumn and Winter, least in *Spring*, and yet even in *Spring* they prevail sufficiently to temper, in a good measure, the pernicious blasts from the East and North.

2. The Eastern Winds are almost equal in *Spring*, and Summer, and near double to what they are in Autumn and Winter.

3. The N. E. Wind blows most in *Spring*, and is double to what it does in Autumn and Winter.

4. The N. Wind blows most in *Spring*, least in Winter; (A) thus far do the Observations of the last Septenary agree to all the foregoing, even from 1716 to 1765 inclusive: but one difference appears, that in the last Septenary the North winds prevail considerably above the South, whereas in two of the four other Registries the South prevails above (B) the North.

5. But all Registries agree in this, that the S. E. and N. W. Winds are nearly equal, and come next in number to the S. W. and W.

VOL. II.

3 O

I

(A) An eminent and divine Poet of our own, speaking of Zephyrs as proper to the Spring, betrays less knowledge of Nature than of Grace.

(B) In *Gadbury's* and *Say's* Diaries, kept in *London*, for a long series of years, the North was far above double, sometimes sextuple to the South, and likewise the E. and N. E. winds bore a considerably greater proportion to the W. and S. W. than here. Hence the superior warmth and moisture of *Ireland* is easily accounted for.

I shall next exhibit a Comparative Account of the State of the Weather in *London* and *Dublin*, from Registries kept in each Place for the Space of 40 Years and upwards.

The first of these, extending from the year 1669 to 1689 was published by *John Gadbury*, whose Pen was undoubtedly far more usefully employed in this manner than in vain attempts of Prognostication.

The second extending from 1695 to 1717, in which the observations were also made in and near *London* by a correspondent of *Dr. Short*, whom he calls the reverend, worthy and ingenious *Mr. Say*, late of *St. James's, Westminster*, I have extracted from the Doctor's curious performance, *The Chronological History of the Weather and Seasons*.

The third is an Extract from the Registries kept for the most part by myself in *Dublin*, from the year 1716, to 1758.

For the ease of my reader I have placed the several extracts drawn from these respective Registries in one View, in order that a just Comparison may be made with regard to the real and distinguishing nature of the temperature of the air and state of the Weather in *London* and *Dublin*.

L O N.

LONDON

from 1669,
to 1689.

March.

During these 21 years *March* appears to be justly entitled to the character of *many-weathers*, and generally has frost intermixt with it's rain and winds, and the pr. Winds are from some point of the N. or E. but rarely W. or S. W.

During the same period, only one month was remarkably dry, viz. that of 1683, the year of the great Frost.

April.

During these 21 years *April* agrees to *March* in the turbulent and variable state, as to heat, cold, dryness and moisture, frequent winds and frosts; as also in the winds blowing most from some point of the N. or E. and more rarely from the W. or S. W. tho' oftener from the two last points than in *March*; and whereas during this period there was but one dry *March*, there were 2 dry *April*'s.

LONDON

from 1695,
to 1717.

March.

During the like period of time *March* is entitled to the same denomination, and the pr. Winds are from some point of the N. or E. rarely W. or S.

During the same period *March* was seldom free from Frosts, and about 5 times dry, and only 3 times warm.

April.

During this period the changeable weather observed in *March*, continued through *April*, with the pr. Winds at some point of the N. or E. but with the increasing heat, more to the S. than in *March*; also frosts were not unfrequent; and out of 21 *April*'s near 6 were dry.

DUBLIN

from 1716,
to 1758.

March.

During these 43 years the old Character of this month is abundantly established, and it is seldom free from frost, snow or hail.

Out of all the 43 *March*'s only 4 were remarkably wet, but 9 dry.

During the same period, the pr. Winds were from some point of the N. or E. and yet the N. and E. winds did not exceed those from the W. and S. so much as in the *English* registries, the first to the last here, being only a little above an equality, viz. as 54 to 48.

April.

Not only participates with *March* in it's changeable state of weather, but moreover, during this long period, vies with, if it does not exceed it, in the great frequency of frost, hail and snow, tho' we have here and there rarely some very hot summer-like days, and high Winds not unfrequent.

During this period the pr. Winds in *April* have been from some point of the E. or N. and indeed in a far greater

London from 1669,
to 1689.

London from 1695,
to 1717.

Dublin from 1716,
to 1758.

April.

er Proportion to those from the W. and S. than in *March*.

April in *Dublin* appears during the like period of time to have had more Easterly and Northerly winds than *London*.

May.

During these 21 years *May* agrees to *March* and *April* in the changeable state of the weather, and in the frequent winds, which blew most from the W. and next from the S. W. more rarely from the N. or E.

May.

The changeable state of the weather as in *March* and *April*, continued through *May* during this period, and the pr. Winds were from some point of the N. or E. rarely from the S. or W.

May.

During the space of 43 years, participates with *March* and *April* in the changeable state of the weather; and particularly as to heat and cold; and though sometimes very hot, is more frequently eminent for cold, which it's prevailing winds sufficiently account for, having indeed a greater predominance of winds from the E. or N. points than either of the two former months, even near double to those from the W. and S. points: and frosts are not unfrequent in this month.

The old *English* proverb. *May come early or late* will make the *Cow quake*, holds strongly with us, as likewise the pernicious effects of it's blasts from the E. and N. quarters on valetudinarians, to whom they often prove critical, are hence very clearly explained.

London from 1669,
to 1689.

London from 1695,
to 1717.

Dublin from 1716,
to 1758

May.

As far as we may be allowed to pronounce from a range of above 60 years observation, there is some degree of a periodical revolution with regard to the winds both in *England* and *Ireland*, particularly in the constant return of the Winds from the E. and N. points in the months of *March*, *April*, and *May*; and this is more conspicuously so in *Dublin*, where these winds constantly gain the ascendant over our proper trade winds from the S. and W. points, in *March* considerably, in *April* more, in *May* most of all.

June.

Of these 21 *June's*, about 13 were fair, the rest cloudy, wet and windy.

The pr. Winds in *June* during the same period were chiefly W. sometimes S. W. and N. W. rarely any point of the E.

June.

Of the 22 *June's* from 1696 to 1717, 12 are hot or dry, 3 wet, the rest mixed, fair, hot, cold, wet and windy by turns.

N. B. The account of the Winds is imperfect, and for half the time only; however the pr. Winds are S. W. but more frequently N. or E. than in *Gadbury's* Diary.

June.

Of these 43 *June's* in *Dublin*, about 12 are fair and dry, 12 wet or winter-like, and the rest mixt: so that in both the *English* registries the proportion of fair and dry weather is considerably above double to what it is with us.

The Winds from the W. and S. during this period exceeded a little those from the E. and N. for the S. W. W. and N. W. to the S. E. E. N. E. and N. were about as 55 to 53.

July.

London from 1669,
to 1689.

July.

Of those 21 *July's* about 10 were mostly fair, the rest cloudy, wet and windy, viz. somewhat more wet and less fair than in *June*.

The pr. Winds during 17 years, of this period were chiefly W. next S. W. and more S. W. than in *June*; and very rarely any point of the N. or E.

August.

Of these 21 *August's* about 7 were fair, the rest wet and windy, and frosty mornings were frequent.

The pr. Winds during 17 years of this period W. rarely any point of the S. N. or E.

London from 1695,
to 1717.

July.

Of 23 *July's*, viz. from 1695 to 1717 inclusive, about ten are fair and dry, about 5 are wet, the rest mixt. The account of the winds this month is imperfect, scarce for half the time; however the pr. winds appear to be S. W. and some point of the E. or N.

August.

Of 23 *August's*, viz. from 1695 to 1717 inclusive, not above 8 could be reckoned dry and hot, and but 2 wet, the rest variable as to heat, cold and moisture. The account of the winds is imperfect, however the pr. Wind was S. W. sometimes W. and some point of the N. or E.

Dublin from 1716,
to 1758.

July.

Of 43 *July's* in *Dublin*, 16 were wet, and about 7 fair and dry, whereas in *June* the number of wet and dry were near equal: and so in the *English* registries *July* was considerably wetter than *June*.

The Winds from the W. and S. points to those from the E. and N. bear a much greater proportion than in *June*, being near double of the first to the last in *July*, whereas in *June* they are near upon an equality.

August.

Of 43 *August's* in *Dublin*, nearly 16, were fair and dry, and 14 wet, the rest mixt: and consequently at an average, *August* makes the nearest approach to a truly Summer month. The Winds from the W. and S. points are rather above double to those from the E. and N.

The COMPARISON then of the *English* and *Irish* SUMMERS, stands thus.

<i>English</i> Registries taken together.		<i>Dublin</i> Registry.	
DRY	WET	DRY	WET
<i>June</i> 25	11	12	12
<i>July</i> 20	16	7	16
<i>August</i> 15	22	16	14

✂ I must acknowledge that this account of the so much greater proportion of the Winds from the W. and S. points to those from the E. and N. in the Summer does not agree to that of the seven years following, in which the Winds from the W. and S. absolutely exceeded those from the E. and N. only in Autumn and Winter. Nevertheless, a range of 43 years should seem better to enable one to make some advance towards truth, than one of only seven Years.

September.
During these 21 years *September* in some sort resembles *March*, viz. in the great vicissitudes of heat, cold, frequent winds, rains and frosts, and in the wind veering more to the N. though it differs from *March* in that the W. wind is still by far the most predominant. Of these 21 *September's* only 4 were fair or dry.

September.
Of 21 *September's*, viz. from 1697 to 1717 inclusive, 6 or 7, (nearly $\frac{1}{3}$ d) were fair or dry, 2 wet, the rest various or changeable.
The pr. Winds during 12 years of this period were W. more rarely some point of the N. and E. or S. W.

September.
Of these 43 *September's* in *Dublin*, about 12 were wet, windy and winter-like, and 12 fair, dry and Summer-like.

September is less cold than *March*, having less of the N. and E. winds, and less frost.

It is more stormy than *June* and *July*, the vapors, or the declining Sun, being not dissipated as before, are congregated near the earth.

The W. and S. W. winds are almost double to those from the E. or N. and on comparing with the *English* registries, the Winds here were more Southerly.

De-

London from 1669,
to 1689.

October.

During these 21 years abounded with frequent rains and winds, besides frequent frosts and some fogs.

The pr. Winds were still Westerly, and but rarely any point of the S. E. or N.

November.

During these 21 years Winds were frequent, and rain, frosts and fogs sometimes attended.

The pr. Winds during the same period were W. though nearly one half were Easterly.

London from 1695,
to 1717.

October.

Of these 21 *Octobers* the account differs considerably from *Gadbury's*, for about 10 were dry and fair, and 2 rainy, the rest various as to heat, cold, rains, winds and some frosts; also the pr. Winds though imperfectly described, were more from some point of the N. or E. than from the S. or W.

November.

Of 19 *November's*, viz. from 1699 to 1717, about 7, viz. above one third have been mild and dry, about 3 rainy, the rest various as to heat, cold, frosts and Winds.

The pr. Winds during 9 of these years were S. W. more rarely N. N. W. and S. E.

Dublin from 1716,
to 1758.

October.

Of these 43 *October's* in *Dublin*, 11 were predominantly wet, and 16 fair, dry or Summer-like; so that *October* at a medium is considerably more fair and dry than *September*, and it seems to have the greater share in what is called our *little Summer*.

The same observation holds in the second *English* registry during the shorter range of 21 years, though it fails in the first: and *Dr. Robinson* has observed the heat of Autumn in *Dublin* to exceed that in *London* a little.

October exhibits more frost than *September*, and withal is a little more windy.

The Winds from the W. and S. points are almost double to those from the E. or N.

November.

Is not much above half the number of times fair and dry, compared to *September*; for, out of 43 months we have but six fair and dry to 10, wet and windy.

It has more fogs, and a good deal more winds and storms, and more frosts than *October*, and for a very obvious reason,

Weather.

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London from 1669,
to 1689.

London from 1695,
to 1717.

Dublin from 1716,
to 1758.

November.

son, viz. that whilst the Sea and Earth are ever teeming with vapors, the further declining Sun hath not power to dissipate them, and did not storms proper to this month by the gracious and wise disposition of providence, perform this work, undoubtedly the ill effects of the stagnating vapors would be much more felt than they are. The pr. Winds during the above 43 years are S. W. W. and N. W. being above treble to those from the E. and N.

Upon comparing this and the *English* registries, our *Novembers* appear to be considerably wetter.

December.

Of 21 *Decembers* 8 were frosty, 6 wet and windy, the rest mixt: some Fogs, and not one without frost. The pr. Winds for 16 years were W. more rarely some point of the E. or N. very rarely S.

The intense frosts were commonly attended with Easterly winds.

December.

Of 22 years, viz. from 1695 to 1716 only 4 were frosty, 5 warm and dry, 3 wet, the rest various.

The record of the winds this month is not accurate; however, during 9 years the winds were pretty near equally at some point of the W. E. or S.

December.

With the declining Sun, proves much seldomer quite fair or dry, but much oftener wet and windy than *November*, being fair and dry scarce above twice in the 43 months, though sometimes a few odd warm days occur, but 12 times predominantly wet and windy. The pr. Winds are S. W. W. and N. W. and above treble of these to those from the E. and N.

London from 1669,
to 1689.

London from 1695,
to 1717.

Dublin from 1716,
to 1758.

December.

Our *December's* are much more wet than in the *English* registry, and the Winds more Squally.

The 4 grand Frosts recorded in this History were all introduced with Easterly winds, or winds veering from N. E. to S. E.

January.

Of 21 *January's* 9 were frosty, and scarce one free from frost, most of the rest mixt of rain, wind and frost, and sometimes mists.

The pr. Winds for 16 years were W. more rarely some point of the E. or N. very rarely of the S.

January.

Of 22 *January's* in this record, viz. from 1695 to 1716, only 3 were quite frosty, 2 dry, 2 rainy, the rest various, now and then warm like Summer.

The winds during 13 years were pretty near equal from the several points, but rather a little more from some point of the E. or N. than W. or S. but still not in so great a proportion from the N. and E. as in *Spring*.

January.

During these 43 years in *Dublin*, *January* seems to be more prolific in storms and rains than *December*: for of this number, viz. 43, about 14 were predominantly wet or windy, or both, and 6 fair and dry, or frosty. Tho' few *January's* during this period, are wholly free from frost, we have not half so many wholly frosty as in *Gadbury's* registry.

The pr. Winds are S. W. S. E. W. and N. W. and those from the S. and W. are above double to those from the E. and N.

Upon a comparison with the two *English* registries we have more rains, and our Winds are more Southerly: from whence appears the reason of the greater warmth of our Winters here than

London from 1669,
to 1689.

London from 1695,
to 1717.

Dublin from 1716,
to 1758.

January.

than in *London*, being
according to Dr. *Bryan*
Robinson as 1.45 to 100.

February.

Of 21 *February's*,
about 9 are frosty, the
rest wet and windy, or
mixt, i. e. wet, windy,
foggy and frosty, so that
scarce one month was
entirely free from frost ;
but *February* seems to
have more warm and
pleasant days intersper-
sed than *December* or *Ja-*
nuary.

The pr. Winds in
February during this pe-
riod were W. and fre-
quently some point of
the N. or E, even much
more frequently from the
2 last points than in Sum-
mer, very rarely any
point of the S.

February.

Of 22 *February's* 4
were frosty, the rest va-
rious as to weather, and
not unfrequently mild
and fair.

During 11 years of
the 22, the Winds were
more from some point of
the E. or N. or S, than
from the W.

During about ten years
the pr. Winds in winter
inclined to some point
of the E. or N. though
less than in *Spring*.

February

Abounds with wet
and windy weather, and
storms, as *January*, and
of the 43, 12 are pre-
dominantly wet or win-
dy, and mostly both, and
about 5 quite fair or
nearly so, and indeed
more Summer-like than
in *December* or *January*,
and less fogs, the ap-
proaching sun now be-
ginning to dissipate the
vapors ; this also agrees
to the *English* registries,
where *February* has more
warm and pleasant days
than *January* or *Decem-*
ber.

Though not many *Fe-*
bruary's are quite exempt
from frost, yet here were
not half so many frosts,
as in the *English* regi-
stries ; and accordingly,
the Winds here were
more from the S. and
W. and much less from
the N. and E, than there.

The reigning Winds
during these 43 years
chiefly S, W. next W.
N. W. and S. E. and
above treble from the
W. or S. points to those
from the E, and N.

N. B. It is to be observed concerning the foregoing extract of the registries in *Dublin* for 43 years, that one little inevitable inaccuracy, attends it during the last 7 years, occasioned by the alteration of the Style, for which reason every month during this period, takes in eleven days of the subsequent month.

Now, in order to make up this deficiency, I here present a Scheme of the Seasons in *Dublin* for a larger series of time, in which is observed no difference as to months, but only the general difference in the four Seasons of the year.

Year.	S P R I N G.
1716	Various
1717	Various
1718	Various
1719	Various
1720	Various
1721	Various
1722	Various, inclining to Wet
1723	Unusually Hot and Dry
1724	Mostly Fair and pretty Dry
1725	Inclining to Fair or Dry
1726	Fair and Dry
1727	Various
1728	Mild and mostly Fair
1729	Cold and Dry
1730	Various
1731	Dry and Cold: ended Hot
1732	Various, the last month Rainy
1733	Very Dry
1734	Warm, but a Cold May
1735	Open partly; ended cold
1736	Generally Mild
1737	Warm
1738	Seasonable
1739	Mostly Cold
1740	Dry and Cold
1741	Excessively Dry

yet upon the whole, both the *English* and *Irish* registries have been faithfully kept.

O F

I shall now from a Review of this last Scheme for 50 Years at *Dublin*, and of the two foregoing Registries at *London*, make some Comparison of the State of the several Seasons in each.

The Medium viz. of *Gadbury's* and *Say's* Registry is 13 cold *Springs* in 44.

In both the *London* registries, of 41 Summers, there were at a medium nearly 20 hot and dry, and 20 wet, cold and windy, viz. nearly half hot and dry.

In both the *London* registries of 41 Autumns 15 were frosty, dry or warm, 9 wet, the rest changeable.

In both the *London* Registries of 48 Winters 19 or 20 were frosty, 17 mild, the rest changeable.

In the *Dublin* Registry for 50 years are 16 cold, backward or dry *Springs* to 50; so that the proportion of cold and dry *Springs* was a little greater in *Dublin* than in *London*. Doth not this difference arise from our more Northern situation, and consequently our greater nearness to the great mountains of Ice and Snow in the North?

In the *Dublin* registry of 50 years 22 were fair, hot or dry, and 24 wet, the rest changeable; so that, in the *London* registry the number of hot and dry Summers were almost equal to those of the cold and wet, but in *Dublin* the number of the wet a little exceeded that of the hot and dry: Upon the whole it does not appear that *London* has a great deal to boast of above *Dublin* with regard to the superior heat and serenity of its Summers.

In the *Dublin* registry of 50 years, 16 Autumns were fair and dry. 12 wet, the rest changeable, so that our Autumns also are a little wetter.

In the *Dublin* registry of 50 years, 13 Winters were frosty, 14 wet, and about 26 open, mild or warm, so that, agreeable to all observations, our winters are in far greater proportion warmer and moister than in and near *London*, which furnishes another conclusion of greater importance, viz. that notwithstanding some defects inevitably attending such registries yet upon the whole, both the *English* and *Irish* registries have been faithfully kept.

OF WINDS, and STORMS in particular.

The Lord hath his way in the Whirl-wind and in
the Storm. NAHUM i. 3.

NOT that alone which solaces and shines,
The rough and gloomy challenges our praise.
The Winter is as needful as the Spring,
The Thunder as the Sun : a stagnate mass
Of Vapors breeds a pestilential air :
Not more propitious the Favonian breeze
To Nature's health than purifying Storms :
The dread Volcano ministers to good,
It's smother'd flames might undermine the World,
And Ætna's fulminate in love to man.

YOUNG'S NIGHT THOUGHTS.

Praise the Lord, Fire and Hail, Snow and Vapors,
and stormy Wind fulfilling his Word. Psalm
cxlviii. 8.

N. B. The Year with me always commences with
March, and ends with *February*, which with me is the
last Month of the Year.

TABLE I
fro

Year	Mon
1697	October 8 February 1
1698	February 7
1699	September
1700	December February 6
1701	December February 2
1703	October 20
1704	January 20 October 2 following November
1705	March 19 August 11 Dec. 6—7
1706	October 20
1708	December
1710	October 10 From Nov Dec. 3 and Dec. 6
1712	January 20
1714	February
1716	September
1717	August 20

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Year	Month	Description.
1715	Feb. 15—16	great storm.
1716	August 11	tempestuous Night
	September 13	A Tornado Tempest.—See Tab. I. whence it appears to have been common to London and Dublin
	November 19	stormy
1717	October 8—9	Degree of hurricane
1719	February 26—27	great storms
1720	March 24	great storm
	April 19—20	hurricane
	February 19	stormy
1721	November 13—18	stormy
	January 26	storm
1722	November 15	storm
	November 19—20	stormy
	February 19—20	great storms
1723	March 24	great storm
	November 9 to 10	storms
	November 22 & 23	storms.
	December 4	stormy
1724	July 8	great storm
	November 25	tempest of short duration
	December 7	tempestuous
	December 15 to 16	hurricanes
	December 25	tempest for two hours
	January 13	tempestuous
1725	May 27—28	stormy
	July 7—8—9	stormy
	December 2	storm
1727	— 11—12	storm
1728	October	storm
1730	February 9	great storm
1731	September 4	gh winds
1732	December 21	great storm
	— 30	great storm
	January 4	violent storm
1733	December 14	A storm of longer duration than usual
1734	April 19	storm
	December 14	storm
	January 6—7	A storm, which ended in great rain on the 8th, where there was a most violent storm in England, and vast damage on sea and land, so that it was fier here.—It extended thence, Holland & Flanders.

T A B L E III.

The Number of STORMS, with the respective Months in which they blew.

Storms in <i>London</i> from 1697 to 1717.			Storms in <i>Dublin</i> , from 1716, to 1756.		
<i>March</i>	—	1	—	—	3
<i>April</i>	—	0	—	—	3
<i>May</i>	—	0	—	—	1
<i>June</i>	—	0	—	—	1
<i>July</i>	—	0	—	—	4
<i>August</i>	—	2	—	—	4
Total of Spring and Summer Storms in <i>Lon-</i> <i>don</i> , for 20 Years,			Total of Spring and Summer Storms in <i>Dub-</i> <i>lin</i> , for 40 Years.		
}			}		
3			16		
<i>Sept.</i>	—	2	—	—	9
<i>Oct.</i>	—	5	—	—	9
<i>Nov.</i>	—	2	—	—	14
<i>Dec.</i>	—	7	—	—	17
<i>Jan.</i>	—	2	—	—	16
<i>Feb.</i>	—	6	—	—	17
Total of Autumn and Winter Storms in <i>Lon-</i> <i>don</i> for 20 Years.			Total of Autumn and Winter Storms in <i>Dub-</i> <i>lin</i> , 40 Years.		
}			}		
24			82		

T A.

C O R O L L A R Y.

The Storms in the Autumn and Winter Half Year, are vastly more frequent than in the Spring and Summer: in the shorter range of 20 Years at *London*, about as 8 to 1. In the longer range of 40 Years at *Dublin*, nearly as 5 to 1: and in a somewhat longer range in *Dublin*, from 1715 to 1758 inclusive: the No. of Storms in each Month was as follows.

<i>May</i>	—	1		<i>September</i>	—	9
<i>June</i>	—	1		<i>October</i>	—	9
<i>April</i>	—	3		<i>November</i>	—	14
<i>July</i>	—	4		<i>December</i>	—	17
<i>August</i>	—	4		<i>January</i>	—	17
<i>March</i>	—	5		<i>February</i>	—	19

T A B L E

T A B L E IV.

Storms from 1760 to 1765.

Year	Months.	Moon's Age.	Points.
1760	November 6	Day before new moon	W. and S.W. 4
1761	October 22	3 days after last quarter	S. E. 3
	— 28	2 days after new moon	S. 4
	Nov. 19—20—21	Last quarter	S. W.
1762	January 16—17	Day before last quarter	W.
	March 12	3 days after full moon	S. W.
	October 20	3 days after new moon	S. E.
1763	September 10	3 days after full moon	S. W.
	October 2—3 a storm and great floods.	2 and 3 days after last quarter	N. E.
	December 1	4 days before new moon	W.
	— 28—29	Last quarter	S. W.
1764	Sep. 13—14—15	3, 4 and 5 days after full moon	W. and S.W.
	December 3—6	2 and 3 days before full moon	W. and S.W.
	December 18	4 days before new moon	S. E.
1765	September ended	Day after full moon	W.
	November 25	3 days before full moon	S. W.
	December 10	3 days before new moon	S. W.

Number of P O I N T S.

W.	--	--	--	6	S.	--	--	--	--	1
S. W.	--	--	--	9	N. E.	--	--	--	--	1
S. E.	--	--	--	3						

COROLLARIES.

1. The greatest part of the Storms, are from the S. W. and W.

2. Not one Storm during these 7 Years at new or full, but mostly at a considerable distance from either.

3. The above Calculations may be of Use in the Doctrine of Chances, where Navigation is concerned. For a Man who commits himself to the Sea only in Spring and Summer, has 5 chances to 1, of avoiding a Storm to what he has who goes in Autumn and Winter.

4. The No. of the Points from whence the Storms blew at *Dublin* for 40 Years.

S. W.	57
S. E.	12
W.	9
S.	6
N. E.	1
E.	1

5. Most of our Storms came from some point of of the S. or W. viz. by far the most from the S. W., next from the W. and S. rarely from the N. and E. so that a certain eminent Divine, who talks of Storms from the angry North, has but badly copied Nature : but we read *Job. xxxvii. 9.* "Out of the South cometh the Whirlwind, and Cold out of the North," which is a far more just account of this matter, and holds in our Climate. Compare *Isa. xxi. 1.* and *Zech. ix. 14.* and the S. Wind in *Palestine* "blew from the Sea," as it does with us.

This may be of use in Oeconomicks, particularly in regard to Situation in building of Houses, and furnishing a proper precaution against the blasts from the S. W.

6. In the *English Registries*, *October*, *December*, and *February*; and in the *Irish*, *November*, *December*, *January*, and *February*, are far more prolific in Storms than

than the grand equinoctial Months of *March* and *September*; so little dependence is there on vulgar Tradition.

7. As one considerable point in view in preserving these Records of the Winds and Weather, was to establish or explode, by faithful Observation the commonly received Opinion of the influence of the Moon or the Weather, I have annexed the Age of that Planet to each Storm in the above Tables.

The Astrologers with confidence tell us, that the influence of the Moon is exerted either at the time of the New or Full, or within three days of either, in which their Cunning is very remarkable; even in taking Care to allow themselves the large scope of six days for their Prognostic, though at the same time this implies a Consciousness that the great Com-motions of the Atmosphere were far from being generally synchronous with the new and full Moon; and accordingly it appears from the above History of Storms during a series of sixty Years, there were but eight notable Storms on the Days of the new Moon, i. e. about 8 in 742, and but about six on the Days of the full Moon, i. e. about 6 in 742 Moons.

And then as to their *Triduum*, or 3 Days before or after the New or Full Moon, in the above History it is observable that 23 of the Storms recited, happened within 3 Days before or after the New Moon, and 29 of them within three Days before or after the Full; so that,

- 8 The No. of Storms on the New Moon,
- 6 The No. on the Full
- 23 The No. within 3 Days, before or after the New Moon
- 29 The No. within 3 Days before or after the Full Moon

Give 66 The No. of Storms on the New Moon, Full Moon, and within 3 Days before or after either.

3 Q 2

And

And as to the rest of the Storms, viz. which happened in more than 3 Days before or after the New or Full Moon, 20 of these happened in more than 3 Days before or after New, and 21 in more than 3 Days before or after the full, in all 41, so that here are 41 Storms in more than three Days before or after the New or Full, to 52 that happened within three Days before the New or Full, and but 14 on the New and Full; from whence abundantly appears how little certainty there is in any Prognostications made from hence.

As several of the more sober Philosophers have been ready to acknowledge the powerful influence of Eclipses, with respect to the great Commotions in our Atmosphere, it seems worth while to consider them also. Now, during the above period of 60 Years, there have happened 249 Eclipses of the Sun and Moon; and of all these only the following four appear to have been Synchronous with any of the Storms during the above Period, viz. the Eclipse of the Sun, *October 25, 1706*, the Eclipse of the Moon, *January 13, 1738*, the Eclipse of the Moon, *December 21, 1740*, and the Eclipse of the Sun *July 14, 1748*.

I proceed next to draw up a Catalogue of the great gluts of Rain which have fallen in *Dublin* from from the Year 1716, to 1758 inclusive: together with the Moon's Age and Winds annexed, with which I shall not trouble my Reader, but only with the Observations it suggested, viz.

1. During these 43 Years in *Dublin*, the Number of the respective Winds attending the several Gluts of Rain in the foregoing History was as follows.

S. E.

S. E.	—	—	—	206
S. W.	—	—		156
W.	—	—	—	75
N. W.	—	—		62
N. E.	—	—	—	62
E.	—	—		58
S.	—	—	—	55
N.	—	—	—	41

Thus the S. E. appears to be the most prolific in Rain of all others, even considerably more than the S. W. which how far owing to the Proximity of the *Irish Sea* and *George's Channel*, I shall not take upon me to determine. Here still, agreeably to other observations, the S. exceeds the N. and the N. E. and E. fall but little short of the N. W. and W.

2. The indefatigable Dr. *Short*, p. 450 of his *Appendix on Weather and Meteors* annexed to his *Observations on the Bills of Mortality*, alleges that according to Tradition, the greatest Rains happen at, or a little before or after the autumnal Equinox; but from direct Observations, p. 360, that the most rainy Months are neither at the Equinoxes, nor Solstices, as is commonly believed.

Now among all the Gluts of Rain which happened during these 43 Years in *Dublin*, i. e. of 713 rainy Days, only two happened exactly on the vernal Equinox, and six exactly on the Autumnal, and eleven nearly within three Days before or after the vernal Equinox, and three only within three Days before or after the Autumnal.

Next, as to Storms, which also, according to vulgar Tradition, should accompany the Equinoxes, it appears from the above History of the Storms, during the space of above sixty Years, made partly at *London* and partly at *Dublin*, that out of 131 Storms which

which happened in that period of Time, only one happened on the Equinox, and six within about three Days before or after the Equinox; from whence we see how far vulgar Traditions will stand the Test of solid Fact and Observation

3. *Goad*, in his *Astro Meteorologia*, lays down with great assurance the three following Aphorisms.

1. Ex omnibus effectibus Pluviam sæpissimè producit Novilunium.

2. Plenilunium Pluvias aut Ventos producit idque violentius quam Novilunium.

3. Plenilunium Mensis *Aprilis* & *Augusti* pene semper Pluviam generat.

It is somewhat surprising how Men dare hand down to Posterity such Assertions as Facts, when each of them brought to the test of Observation appears to be false, at least in this Climate: for,

1. Whereas in the above Catalogue of great Rains during the space of 43 Years, there were nearly 713 Days of great Rain, it is observable that only 22 of those great falls of Rain happened precisely on the New Moon, and 141 within three Days before or after the New Moon; and whereas during the same term of 43 Years, there were 532 Moons, the great Rains fell only on 22 of the New Moons, and 141 times within the *Triduum*.

2. As to the Full Moon, with us, the reverse of what is here asserted, happened: for in the above Catalogue fewer Rains attended the Full than the New Moon, viz. out of 713 Rainy Days, only 16 happened on the Full Moon, and 102 on the *Triduum*, that is 3 Days before or after.

3. As to the Full Moons in *April* and *August*, in the above Catalogue during the said 43 Years, it appears that only 7 of the great Rains in *April* happened
at

at the Full, or within the *Triduum*, and 8 in *August* at the Full or within the *Triduum*, but the rest of the Full Moons and their *Tridua* in both these Months during the said long period, were not attended with notable quantities of Rain: from all which and the former Observations in relation to Winds, I am ready to conclude that the supposed influence of the Moon on either our Rain or Winds does not stand the test of solid Observation, but appears to be a vulgar Error,

I shall next examine a certain long established Proverb by the same standard of solid Observation, viz. "*That a Saturday's Moon, comes once in seven Years too soon,*" i. e. commonly proves turbulent or Stormy, which is the result of another Astrological Hypothesis, *Saturday* being the Day consigned by these Sages to the Planet *Saturn*, whom they have thought fit to distinguish by the Name of one of the greater *Infortunes*.

I shall therefore subjoin a summary Account of the state of the Weather attending and consequent upon, each *Saturday's* Moon during the said period of 43 Years, as follows.

A LIST OF NEW MOONS
 happening on *Saturday*, and
 the Weather attending.

Year and Month

1716.	
July 7	Much rain.
November 3.	Some rain and clouds this day : stormy the latter part of the month.
1717	
March 2	High winds this Day, and much snow in the <i>Triduum</i> .
December 21	Fair, no remarkable turbulency the rest of the month.
1718	
April 19	Cloudy and some rain, but a series of fine weather through this Moon.
September 13	Very fine weather for ten days, and no remarkable turbulency till about the last quarter.
1719	
June 6	Fair and pleasant: mild weather the rest of the Moon.
October 31	Driving showers this day, and some high winds in <i>November</i> .
1719—20	
February 27	- A great Snow and Stormy.
1721	
April 15	Fair this day: mild weather the rest of the Moon.
	Fair

1721-1722
January 6

Fair this day, a little wind but no remarkable turbulency the rest of the Moon.

June 2

Cloudy and wet this day; mild weather the rest of the month.

September 29

Pleasant this day; moderate weather the rest of the Month.

1722-23
February 23

Cloudy and fleet this day: some high Winds this Moon.

November 16

Weather various this day: some high winds this Moon.

1724
March 14

Rain and high Winds.

1725
May 1
September 25

Fair weather most of the Moon.

Rain this day: high winds two days after.

1725-26

January 22

Fair this day: the rest of the month not remarkably turbulent.

June 18

Cloudy, some rain and fair weather this day: moderate weather the rest of the month.

November 12

Clouds and snow: stormy next day.

1727
March 11

Fair mild weather the rest of the Moon.

1728
August 24

Wet and windy this Moon.

1729
January 18
October 11

Wet and windy.

Hazy, very windy and wet.

1730
March 7

Much rain this day, and for some days.

July 4

Cloudy and a little rain now, and good part of the Moon.

November 28

Fair: moderate weather mostly the rest of the Moon.

1731
August 21

Fair this day : some high winds in the sequel.

1732
May 13

Showery : mild weather the rest of the Moon.

1732-33
February 3

A Storm this day, and a stormy month.

June 30

Hazy this day, but no turbulent weather in the sequel.

1734
August 17

Fair this day: wet and windy sometimes this Moon.

December 14

A Storm and much rain.

1735-36

January 31

Serene this day : rain the following, and a storm the next.

May 29

Some rain this day, but no turbulent weather followed.

October 23

Much rain : turbulent near the first quarter.

1737
July 16

Fair this day : some squalls within the month.

December 10

Fair : some Storms within the month.

1738

April 8

Cloudy : no turbulent weather the rest of the Moon.

September 2

Rain this day : wet and windy after.

1739

May 26

Fair weather, wet and windy after.

1739-40

February 16

Gloomy, mizzling : no turbulent weather till full Moon.

1740

July 12

Some showers : no remarkable turbulency till after the last quarter.

Miz-

1740
November 8

Mizzling and fair : a Storm near the full and after the last quarter.

1741
April 4

Fair and cloudy : no remarkable wet or windy weather followed.

August 29

Fair and cloudy : a storm about the first quarter.

December 26

A fog and frost : windy and stormy before next new Moon.

1743
November 5

Stormy.

1744
March 3

Rain and wind this day and three days after.

July 28

Gloomy : windy within the *Triduum*.

December 22

Gloomy : high Wind.

1745
April 20

Cloudy and some hail : no remarkable turbulency within the *Triduum*, nor after.

September 14

Mostly fair, and followed by fine weather.

1746-47
February 28

Gentle rain, and followed by a series of fine weather.

December 21

Mild weather, and continued for more than usual the greater part of this Moon.

1748
April 16

Serene and cloudy, and some hail : no remarkable turbulency or bad weather the rest of the Moon.

August 13

Fair, and mostly good weather the rest of the Moon.

1748-49
January 27

Fair, and a shower in the afternoon : frequent storms the rest of the month.

1749
June 3
September 30

Fair, and no remarkable turbulency, the rest of the month.

Cloudy, then wet and windy for six days, the rest of the month for the most part pleasant.

1750
November 17

Fair, and continued mild till the end of the month, and till the beginning of the next, when it was wet and windy, but mild and pleasant after.

1751
March 15

Cloudy and some showers, followed by rain and wind.

August 10

Cloudy and wet, and some squalls followed, but the rest of the month mostly fair.

1752
May 2

Fair, no remarkable turbulency the rest of the month.

October 7

Cloudy and mizzling, followed by fine mild weather the rest of the month.

N. S. 1753
February 3

Fair and frosty : the rest of the month somewhat wet and windy.

June 30

Cloudy and a little rain for some days, but no remarkable turbulency the rest of the month.

1753
November 24

Fair : wet and windy the next day : then fair and frosty, the rest of the Moon not remarkably turbulent.

1754
March 23

Mild weather, and no remarkable turbulency the rest of the Moon.

Gloomy

1755
September 6

Gloomy : cloudy and frequent rains the rest of the month.

1756
January 31

Fair and frosty : Windy great part of the Moon.

November 23

Fair and mild for the Season thro' the greatest part of the Moon.

1757
March 9

Cloudy, some rain and wind ; and stormy and wet weather succeeded.

July 16

A little cloudy : frequent rains during this Moon, but no remarkable turbulency.

1758
September 2

Cloudy and some rain, but succeeded by a fine harvest month.

C O R O L L A R I E S.

1. From hence, and from the Catalogue of Storms in *Dublin* above, it evidently appears, that whereas, during these 43 Years, there have happened 76 Moons on *Saturday*, only two of those grand Storms happened on *Saturday*, and consequently the rest of the great Storms must be owing to some other Cause than the supposed influence of *Saturn*.

2. It appears by an impartial Calculation of the Winds and Weather attending the said 76 *Saturdays* Moons, that, so far from being generally attended with stormy weather, the greater part of them have actually been

been attended with fine weather, the lesser number with wet and windy or remarkably bad weather : so that if one were to lay a wager, the Chance would rather be on the side of the fair weather; wherefore I apprehend that this is another Astrological error, and a strong instance of the rashness and impatience of Men in investigating Truth from laborious and painful Observation, but contenting themselves with a few Facts that make for an Hypothesis they have preimbibed, neglecting the rest, and so seeing a little, they presume a great deal and jump to the Conclusion ; and in this manner have Errors (not a few) been transmitted from one Generation to another ; and indeed the supposed influence of the Moon on Rain and Winds, seems to have no better a Foundation than heathenish Idolatry, according to which the Moon was sometimes called the *Queen of Heaven, Cælestis & Urania*, and deemed to be *Pluviarum pollicitatrix*, (A) the Promiser of Rains, and so of all good Things, and hence the Heathens usually indulged in Mirth and Jollity at their new Moons, according to that of *Horace*,

Da Lunæ propere novæ

Da noctis mediæ poculum. CARM. LIB. 3. ODE 19.

And the apostatizing Jews were obstinately bent against all the Remonstrances of the Prophet to burn Incense to her, alledging that when they did so, they had *plenty of victuals and saw no evil* : (B) but these Vanities cannot stand the the test of the growing light of Christianity and sound Philosophy, and we are now enabled to determine in the negative what Lord Bacon, in his *Historia Ventorum*, recommended to Posterity, viz. “ *Dignum certe esset observatione quid possint super ventos, motus & tempora Lunæ cum*
aliquid

(A) Tertullian Apol. c. 23. cited by Dr. Gill in his Comment on Jeremy.

(B) Jer. xlii. 17.

aliquid possint super aquas, veluti utrum venti sint paulo commotiores in pleniluniis & noviluniis quam in mediis, quemadmodum fit in æstibus aquarum."

Dr. Mead's Treatise, *De imperio Solis & Lunæ in corpora humana*, proceeds entirely upon this supposition, viz. of a greater rarefaction of the Atmosphere, as well as commotion of the Water at those times; but alas! Observation does not support it.

In order to make some estimate of the proportion of rainy to dry Weather in this Country, I drew up a Synoptic Table of the entire fair and of the entire rainy Days, or nearly so, in each Month and Year, for the space of 43 Years in *Dublin*, from which Table it appeared that the mean proportion of entire fair to entire rainy Days, was nearly as 7 to 1.

Dr. Short, in the Appendix to his *Observations on the Bills of Mortality*, makes a remark which bids more fair for a Comparison between the *English* and *Irish* Climate, viz. that in a long series of Years in *England* the fair Days to all others were nearly as 2 to 1.

Now in the Table before mentioned, formed from Observation with a good degree of accuracy in *Dublin*, the fair Days were yearly at a Medium 110 to all the rest, i. e. as 110 to 365, and consequently our fair Days at a Medium, should not be quite one third of all the rest, tho' I suspect that, as the Calculations were made in *Dublin*, the Number of rainy Days may be over-rated with respect to several other Parts of the Kingdom, as our peculiar situation a little above the level of the Sea on the E. and near the Mountains on the S. may give us more Moisture and Rain.

But this proportion of the dry to the rainy Days may be further illustrated by the following Summary of the State of the Weather made in *Dublin*, by an ingenious and careful Observer, viz.

S U M-

SUMMARY of the Years 1756, 1757, 1758.

The entire Fair Days to the entire Rainy Day during this period, as far as could be judged in a probable conjectural way, making allowance for Showery Days, and those in which fell Snow or Hail, were, at a Medium nearly as 699, to 61. i. e. nearly as 11 to 1.

This last proportion comes pretty near to mine during a series of 43 Years Observation made in the same City; and though the proportion of Fair to Rainy Weather be considerably greater in mine, yet both and the rest being compared, and Allowance made for the inevitable inaccuracies attending such Calculations, may serve as a reciprocal Confirmation of the truth of the Observation.

Let rash, gloomy and ungrateful Mortals then forbear to murmur at this Climate, since it is evident the Bounty of Providence causeth the Sun to shine upon us in a far greater Degree than we commonly imagine or deserve.

T H E E N D.





